

NEW ZEALAND
Sustainable
AQUACULTURE

A+ SUSTAINABLE MANAGEMENT FRAMEWORK

New Zealand Greenshell™ Mussels



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1 Introduction

The A+ programme and Sustainable Management Frameworks (SMF) were developed to showcase the sustainable practices of the aquaculture industry in Aotearoa New Zealand and drive positive change towards, and beyond, international best practice. This continuous improvement programme provides a mechanism through which farmers can be guided, supported, and encouraged in this endeavour. It provides a platform for monitoring and improving industry performance across numerous sustainability considerations such as animal welfare, ecological effects and inputs, engagement with communities and Iwi, staff welfare, utilisation of resources, and biosecurity.

This Greenshell mussel SMF details how the A+ programme monitors and guides improvement of farming practices and protocols within the Greenshell mussel industry of Aotearoa. It provides assurance that our farmers have committed to continuously improve their practices and provide transparent information about their performance. Greenshell mussels are among the most sustainable sources of healthy food in the world (Thinkstep Ltd, 2021) and our farming practices are continuously improving.

The aim of the SMF is to achieve the following:

- Facilitate best environmental practice through research, risk management, ongoing monitoring and reporting, and promotion of continuous improvement.
- Promote a culture of environmental stewardship that supports and enhances clean waters and functioning natural ecosystems.
- Communicate our environmental and social performance to inform and allay any community concerns and to increase support for the industry.

This framework sets the targets and structure for the A+ environmental programme available to NZ aquaculture farmers. It is through the A+ programme that farmers can track their progress, report against key metrics, and gain support and resources to help maintain momentum and continuous improvement.

This SMF and the associated A+ programme will be reviewed regularly to ensure they remain up to date and fit for purpose. Review of the A+ programme and all associated resources and tools is an ongoing process which ties in with annual reporting and feedback.

1.1 The Aotearoa Aquaculture Context - National Prerequisites and Legislation for Farming

In Aotearoa NZ, the aquaculture industry is governed and developed under multiple environmental management frameworks that set a high standard for farming. Key among these is the Resource Management Act 1991 (RMA) that dictates the environmental requirements for farm establishment and operation in the coastal space. The RMA requires resource consent to be obtained from a local council before farming can commence, which includes a thorough assessment of environmental effects of the proposed aquaculture activity. This assessment covers issues such as location, potential effects of farm structures, potential effects on marine biota, landscape and public values, and conditions for operation and, if required, monitoring. In addition to the RMA, marine farmers operate under additional legislative settings within the New Zealand Coastal Policy Statement, which is delivered through Regional Coastal Plans, and world class food safety regulations. This strong framework of environmental legislation provides a system that supports sustainable development within environmental limits and is required by government to give effect to the principles of Te Tiriti o Waitangi (the Treaty of Waitangi); thereby setting a high baseline for NZ aquaculture in terms of environmental, social and cultural outcomes.

Because many of the considerations for aquaculture best practice and environmental certification are legislated and regulated through central and regional government in NZ, the A+ programme is able to trust in and rely on these strict regulatory processes to ensure best practice in multiple areas. For this reason, we include reference to many legislative requirements throughout this framework, but they are not directly assessed through the A+ checklist or Verification Assessments, except in the form of recording and reporting non-compliance.

1.2 Mussel Farming in Aotearoa New Zealand

Greenshell mussels are native to New Zealand and naturally grow on rocky shores all around the NZ coast. They are farmed on long lines hanging in the water underneath floats on the surface. They attach to these ropes when they are young and stay there until they are harvested.

Maori name = kūtai

Scientific name = *Perna canaliculus*

Lifecycle: Greenshell mussels are an intertidal or subtidal species normally found on rocky shores or in mussel beds on the sea floor. They reach maturity in 12 – 24 months depending on food availability and water conditions.

Spat: Many of the mussels we grow are naturally sourced from wild stocks. Mussels are broadcast spawners, and whilst some of the wild spat find homes on coastal reefs, many accidentally wash up on beaches where they won't survive. These surplus spat are collected from the beaches and seeded onto the long lines where they will grow and be harvested. Spat collected from beaches have already naturally exited wild reproduction systems and collection of them has no impact on wild population recruitment levels.

A small percentage of mussel spat in NZ is sourced from in-water spat collection sites. These are typically temporary rope structures placed strategically in consented areas where mussel spat are known to settle in abundance. The bare lines are hung in the water to provide removable substrate for the spat to settle on and are removed once a spat population has established. It is then transferred to grow out sites where the mussels remain until harvest.

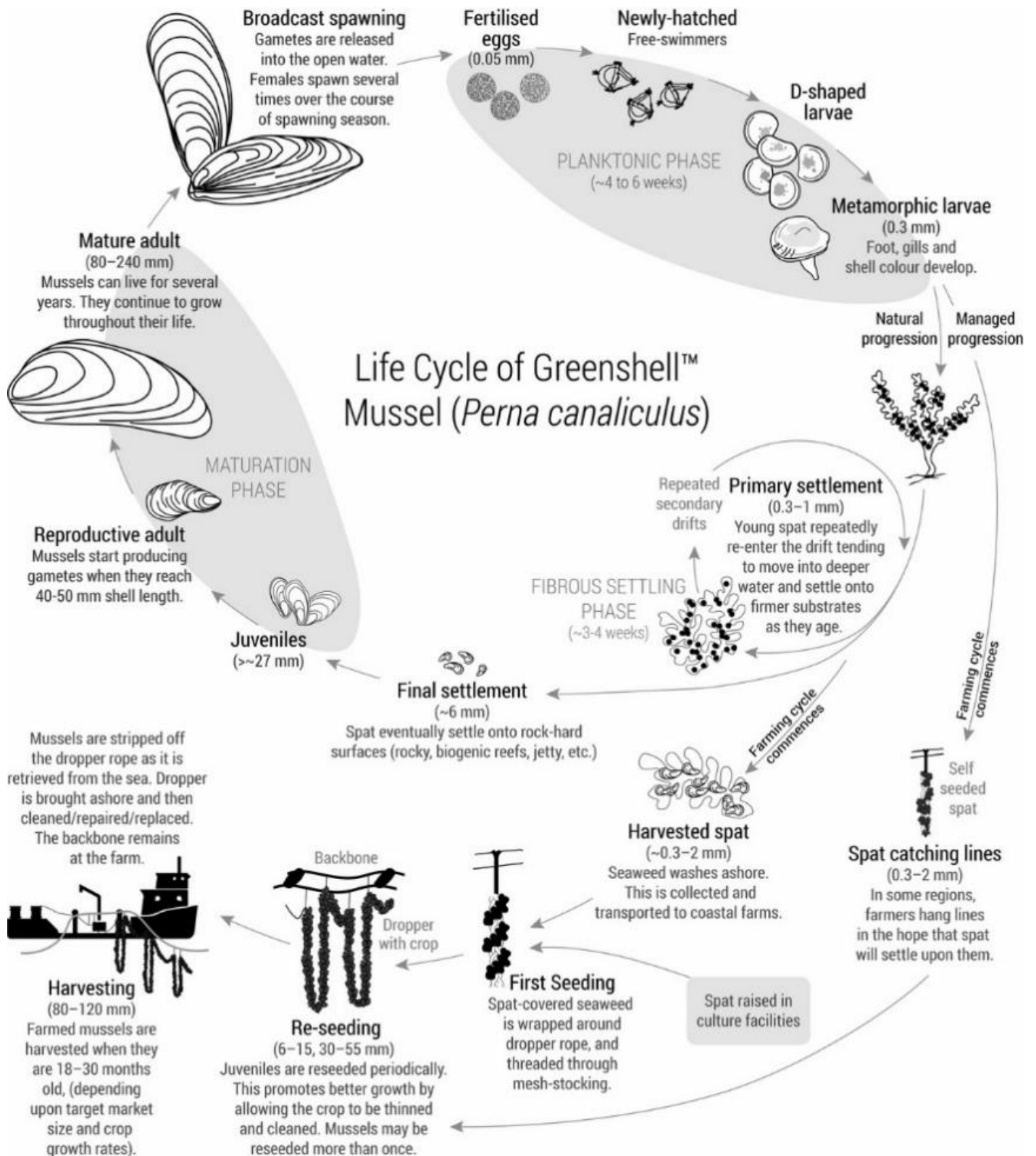
Alternatively, a growing proportion of NZ mussels are raised in hatcheries where they can be selectively bred from the biggest and healthiest parents. Hatchery mussels are fed gourmet algae until they are large enough to go out onto the lines in the ocean.

Feeding: Greenshell mussels do not require any feeding as they filter algae from the natural seawater in which they live. This results in incredible clean farming practices, as no inputs are required.

Production: Mussels have been farmed in NZ since the 1960's and is Aotearoa's largest aquaculture sector. The NZ Greenshell mussel industry produces almost 30,000 tonnes of mussels a year and generates around \$350 million in export revenue.

Our mussels are unique to Aotearoa and are prized by chefs around the world. Most of our mussels go to the USA and China, and most are sold frozen on the half shell.





The lifecycle of farmed Greenshell mussels in New Zealand. NB: In addition to wild caught spat, some spat is now produced in land-based hatcheries which is an expanding area in NZ mussel aquaculture. Source: <https://niwa.co.nz/aquaculture/aquaculture-species/greenshell-mussel>

1.3 Environmental Credentials of NZ Greenshell™ Mussels

Greenshell mussel farming in NZ produces some of the most environmentally friendly animal protein in the world and has a remarkably small environmental footprint. This is supported by independent research, and years of evidence.

1.3.1 Carbon Footprint - Shellfish Life Cycle Assessment

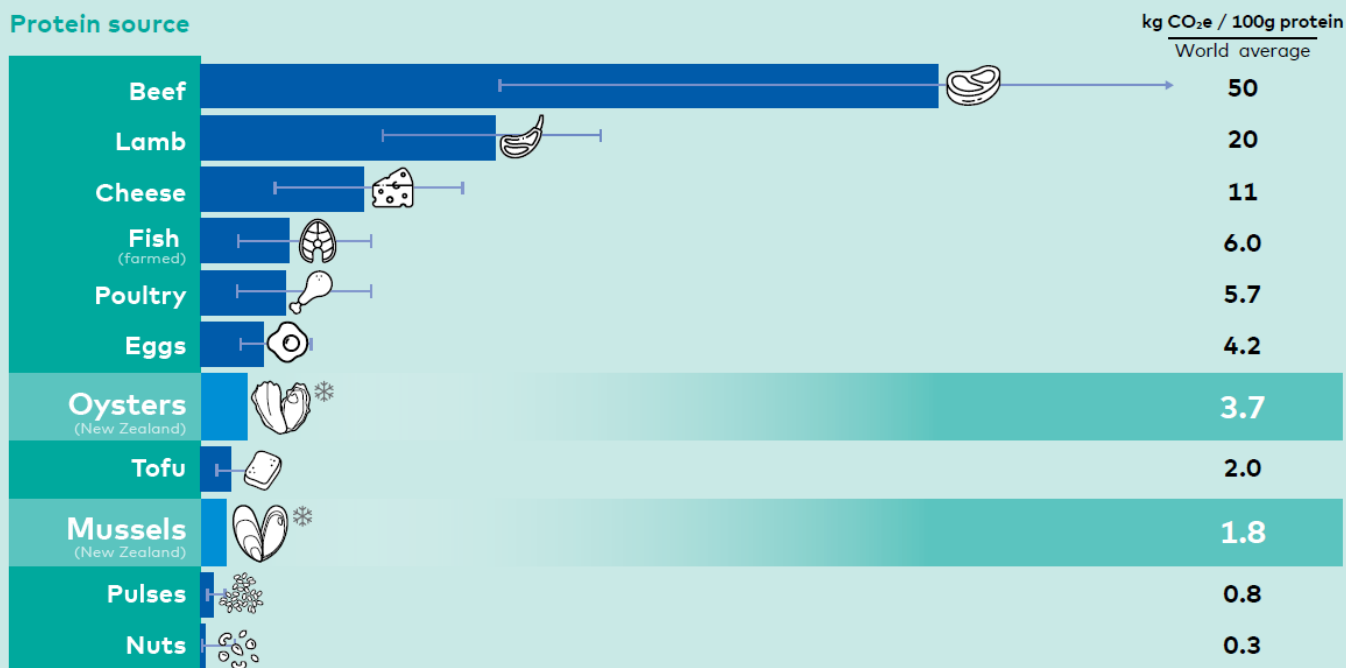
In 2022 an independent assessment of the full life cycle of Greenshell mussels and Pacific oysters was completed and it found that NZ shellfish are among the lowest carbon protein sources in the world (Thinkstep Ltd, 2021). Frozen Greenshell mussels have a carbon footprint like that of tofu.

Key findings include:

- NZ Greenshell Mussels have among the lowest carbon footprints of all animal proteins in the world.
- Live sale of shellfish raises the carbon footprint of the product slightly.
- Air freight substantially increases the carbon footprint but is not an issue for domestic markets. The industry should be encouraging airlines to pursue low carbon alternatives or changes.
- The already low carbon footprint could be further improved through improvement of product packaging, switches to green energy options for facilities and vehicles, and waste reduction.



Carbon footprints of different dietary proteins on the global market – production to retail only
(in kg CO₂e / 100g protein)



— range of results for each protein source

This chart shows global production data. For proteins other than mussels and oysters, it does not necessarily reflect New Zealand conditions. Frozen half-shell products have been chosen because they are the most common product exported from New Zealand.

The full LCA report and summary can be found at <http://www.aplusaquaculture.nz/aplus-resource-library#lca>.

1.3.2 Ecosystem Services of Mussel Farming

A NIWA report by Stenton-Dozey and Broekhuizen (2019) investigated the ecological effects of mussel farming in NZ and found that farms provided substantial benefits to the surrounding environment. Several key benefits of mussel farming were identified:

1. Habitat Creation

Mussel farms create valuable habitat in coastal waters and biodiversity in and around mussel farms is higher than in surrounding waters.

2. Mitigating Nutrients from Human Activities

Mussels filter vast amounts of nutrients associated with eutrophication from the water. These nutrients wash down the rivers from other human activities and are filtered when they reach the mussel farms.

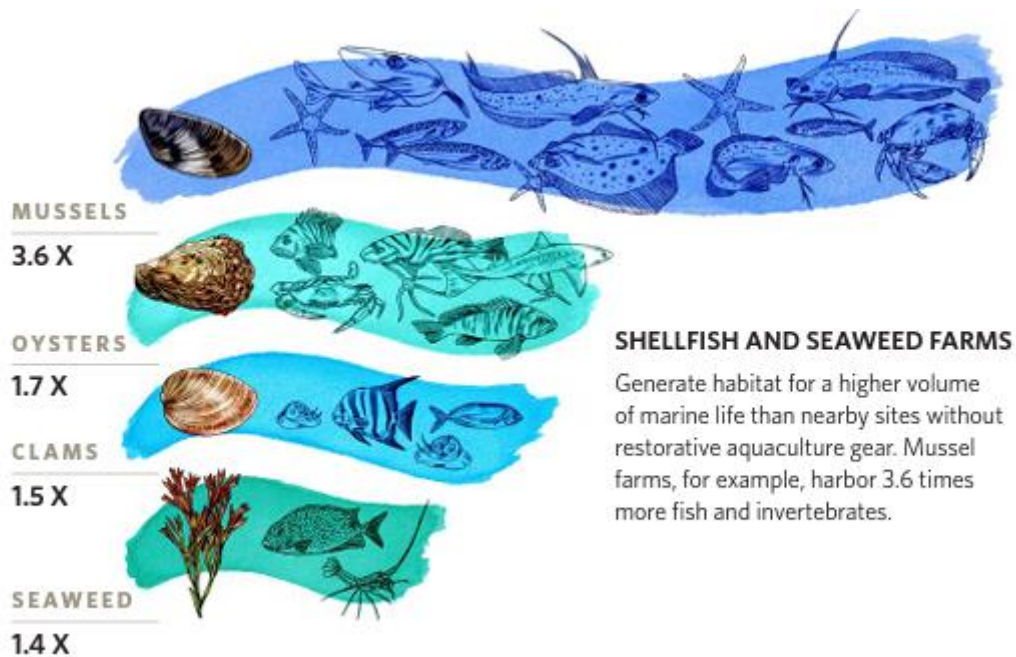
3. Supporting Populations of Fish, Marine Mammals, and Seabirds

Numerous species are positively affected by mussel farms as they provide both a resting space and a hunting ground abundant with food for both marine mammals and seabirds.

4. Mitigating the Effects of Natural Mussel Bed Destruction

Historically there were large natural mussel reefs that provided many of the ecosystems services associated with mussel farms. These were destroyed through dredging, trawling, and sedimentation, and mussel farms are helping fill the gap left by those habitats being removed.

These findings are further supported by the Nature Conservancy who advocate for “restorative aquaculture farming” such as the farming of mussels in NZ (The Nature Conservancy, 2021). Their ‘Restorative Aquaculture Opportunity Index’ identifies NZ as having medium to high levels of opportunity for restorative shellfish aquaculture. Additionally, they have identified that mussel farming is a strong example of restorative aquaculture and contributes more to habitat provision than other shellfish or seaweed farming (below).

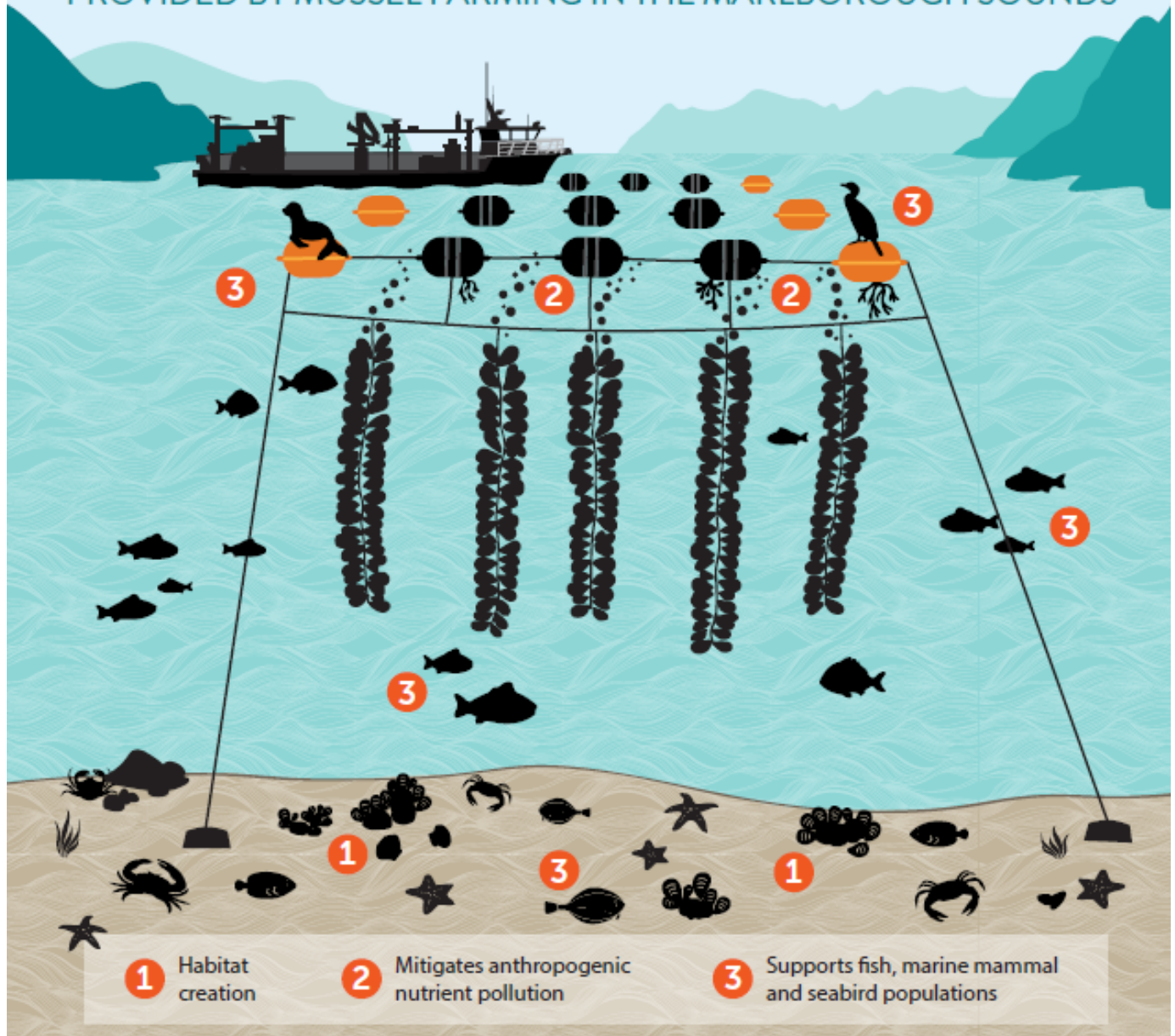


Underwater Abundance (Figure 7) from The Nature Conservancy (2021).

Additional ecosystem benefits have been found in relation to offshore mussel farming overseas which are likely similar in NZ offshore farms. Offshore mussel farms were found to improve the biodiversity of the water and sediments compared to areas still open to trawling, leading to potential restoration of the seabed (Bridger et al., 2022).

ECOLOGICAL & ECOSYSTEM SERVICES

PROVIDED BY MUSSEL FARMING IN THE MARLBOROUGH SOUNDS



1. Habitat creation: Mussel farms create three-dimensional habitat in the seawater column and on the seabed. Biodiversity in and around mussel farms is higher. The current industry scale is estimated to be similar to historic (now destroyed) wild mussel beds.

2. Mitigates nutrients created by other human activities: The mussels on mussel farms filter and clean similar volumes of water to historic wild mussel beds as well as removing nitrogen products from the water column. Mussel harvests remove approximately 50% of the nitrogen load originating from rivers flowing into the Sounds.

3. Supports fish, marine mammal and seabird populations: Mussel farms provide direct benefit to marine life by providing habitat, food and roosting/resting structures. Common and Bottlenose dolphins use farm structures to herd their prey (schools of fish), seals and seabirds use floatation equipment to roost. Recreational fish are always present around mussel farms but feed more actively during seeding and harvesting (and thereby attracting recreational fishers).

The ecological and ecosystem services of mussel farming summarising results from Stenton-Dozey and Broekhuizen (2019).

1.3.3 Local Effects on Wildlife - King Shag Project

The Marine Farming Association (MFA) completed an in-depth study on the King shag (Kawau pāteketeke, *Leucocarbo carunculatus*) in response to concerns that mussel farming may impact the colonies in the Marlborough Sounds (Bell, 2022). The King shag is a rare species of marine cormorant found only in the Marlborough Sounds with a total population comprised of around 800 birds.

The research investigated the behaviour and life cycle of the King shag, as well as the potential effects of mussel farms on the population. The results showed that the king shag was, at worst, unaffected by mussel farming, with some evidence that the population may benefit from farms in the sounds. They found that 56% of the birds they tracked utilised mussel farms for foraging. They also found that the shags preferred to roost on floats than the shore whenever they were available.

The full report can be found at: <https://www.marinefarming.co.nz/king-shag-project/>



<https://www.maclab.co.nz/2020/07/21/supporting-king-shag-research/>

2 Glossary

2.1 Māori Definitions

Iwi	A tribe of related groups or hapū.
Kaitiakitanga	Guardianship.
Kotahitanga	To work together, unity.
Mahinga kai	Food gathering places, garden, cultivation.
Rawa	Resources, goods, wealth.

2.2 Common Terms

Best Practice	Leading methods or techniques that have consistently shown better results than other procedures.
Benthic / Benthos	Of the sea floor.
Biodiversity	This includes the diversity of all biological life from plants to microorganisms to animals, the genetic diversity of all species, and the diversity of habitats that they live in.
Debris	Litter, lost equipment, etc.
Indigenous	Fauna or flora that are native to New Zealand.
Ecosystem	The complex relationship between all species found in an area and how they interact with physical environmental conditions such as habitat type, weather, or temperature.
Ecosystem Services	The services that normal functioning of healthy ecosystems provides such as nutrient cycling or climate regulation.
Genetic Material	Includes viable sperm, eggs, larvae / juveniles, and adults.
Habitat	The type of environment that an animal or plant lives in, broad habitat types include features such as kelp forests, sandflats, intertidal rock pools, etc.
Organic vs Inorganic Waste	Organic waste includes shell waste, or sediment wash-off during harvest etc. Inorganic waste includes litter, farm materials, sewage, or other pollution.
Spat	Juvenile shellfish.

2.3 Abbreviations and Acronyms

AMA	Aquaculture Management Areas
AQNZ	Aquaculture New Zealand
BMSRCS	Bivalve Molluscan Shellfish Regulated Control Scheme
CAP	Cawthron Aquaculture Park
DOC	Department of Conservation
EDS	Environmental Defence Society
SMF	Sustainable Management Framework
EMP	Environmental Management Plan
ESS	Ecosystem Services
FAO	Food and Agriculture Organisation
GLM 9	Green-lipped Mussels Fishery Management Area 9
IAS	Industry Approved Standard
ILO	International Labour Organisation
MMPA	Marine Mammal Protection Act 1978
MPI	Ministry for Primary Industries
MOSS	Maritime Operator Safety System
MNZ	Maritime New Zealand
NIWA	National Institute of Water & Atmospheric Research
NZITO	New Zealand Industry Training Organisation
NZMIC	New Zealand Mussel Industry Council
RCP	Regional Coastal Plan
RMA	Resource Management Act 1991
SQA	Shellfish Quality Assurance
SSM	Safe Ship Management
VA	Verification Assessment
WA	Wildlife Act 1953

3 Sustainable Management Framework Structure

There are six components to the Sustainable Management Framework that underpin everything done by all stakeholders within the A+ programme, and which provide the structure for how the programme runs. The key principles that underpin and inform the SMF are informed by the ISO14001:2004. Further explanation of how they form the structure of the SMF and A+ programme is included below.



3.1 Assess

Assessment is enabled through the completion of the annual self-assessment checklists (Example checklist Appendix 1) which are completed by farmers / operators and provide them with a measure of their own progress. These assessments rely on regular monitoring systems being set up to collect relevant data on quantitative indicators. Up-to-Date example assessment checklists can be found at <https://www.aplus.org.nz/>. This is the method by which the A+ programme gathers key performance data for industry.

3.2 Check

Checking that operators and industry are following the guidelines of the SMF is an important function of a management system. The SMF utilises two methods of checking data and performance.

1. Internal Checks

Each assessment checklist completed by farmers is verified by AQNZ in detail every year. The objective evidence they submit and the data they provide is confirmed before individual scored reports are provided to the farmers. This enables AQNZ to closely observe industry trends and identify areas where greater support for farmers may be beneficial or aid in improving practices. This provides useful direction for efforts such as resource development, funding applications, directing policy, directing research, and providing guidance to industry.

2. External Checks

Each year a subset of farmers are selected to undergo external Verification Assessments completed by a third party assessor. Independent external verification of a proportion of operators provides the industry with the verification it requires to demonstrate its commitment to the sustainable management of its industry. It is a fundamental part of maintaining programme integrity and robustness. The verifier assesses against the objectives, targets, and indicators in section 6.

3.3 Report

Information is collected from the assessment checklists is then aggregated by AQNZ for reporting on trends in the industry's environmental and social performance. Some aggregated KPI metrics are reported via MPI in agreement with industry representative groups (See: <https://www.mpi.govt.nz/fishing-aquaculture/aquaculture-fish-and-shellfish-farming/aquaculture-strategy-for-new-zealand/four-measures-of-the-strategys-success/>). Additionally, AQNZ produces a sustainability report for ongoing public updates on industry progress and sustainability stories (See: <http://www.aplusaquaculture.nz/aplus-resource-library#sustainability-reports>).

3.4 Research

The New Zealand Aquaculture Strategy has prioritised 'opportunities for innovation' through industry-research partnerships and the SMF seeks to ensure that environmental and social issues are represented here. The data collected through the A+ programme and the feedback, evidence, and observations from farmers provides valuable insights which can inform research direction and priorities. The programme helps to identify areas that require additional information to support improvement or progress. It can also assist in informing funding applications for environmental research.

3.5 Review

The SMF and A+ checklists are evolutionary in nature and therefore require regular review to ensure they remain relevant and credible. Annual review of environmental risks, research outcomes, stakeholder engagement, and on-the-job observations from industry can identify areas for improvement of the SMF. This SMF is regularly reviewed and updated where necessary in response to these inputs. Additionally, the associated checklists and verification criteria are reviewed annually to ensure that the right questions are being asked in the most effective and informative way. The programme implementation and tools are regularly reviewed and industry provide feedback on how the programme can be made increasingly accessible, user friendly, and effective. Additionally, AQNZ continuously reviews how they engage with and support industry through A+.

As importantly, internationally expectations and best practice are considered to ensure that the standards set in the SMF adequately reflect best-practice. Regular review allows the updating of these expectations set by the programme.

3.6 Implement

Implementing best practice procedures will enable farmers to achieve the sustainable management objectives of the SMF. Key to implementation is environmental training and education to ensure that operators can understand and manage the effects of farming activities.

AQNZ plays a key role in the training of industry in best practice expectations, and industry are expected to show how this information is being utilised and disseminated to their staff and contractors. AQNZ also develops resources for industry to use as training or recording tools.

3.7 Objectives, Targets, and Indicators of the SMF

For AQNZ to measure the success of the Sustainable Management Framework, the following objectives and targets have been identified:

Objective	Target	Indicators
To report industry's performance against the SMF	Operator checklists are submitted annually	All annual checklist completed and submitted.
	External checks (verification) show high level of compliance	A high level of compliance with the SMF is observed and reported by the verifier.
	AQNZ reports industry trends	Sustainability reports and updates regularly published. Recommendations on improvements communicated to all stakeholders.
To reflect best practice and international expectations	Strong alignment between this SMF and international standards of best practice, with regard to the NZ farming context and legislation	Alignment to multiple international certification systems. Addresses risks associated with aquaculture in NZ. Alignment and inclusion of NZ law and regional consent requirements.

4 Roles and Responsibilities

4.1 AQNZ

Aquaculture New Zealand holds responsibilities over the 6 foundational principles of the SMF. A key responsibility is the facilitation of the A+ environmental programme, which is built upon this foundational framework. This involves numerous annual and ongoing tasks including:

- Hosting and coordinating the online annual checklists.
- Completing internal checks on each checklist and providing detailed feedback to industry on their performance.
- Coordinating annual external checks (Verification Assessments).
- Issuing annual A+ certificates.
- Developing tools and resources for farmers to support best practices.
- Reviewing the programme checklist, tools, and resources each year to identify areas for improvement.

AQNZ is also responsible for reporting industry progress under the A+ programme. Each year, aggregate industry data is compiled and publicly reported through a variety of channels including the MPI reporting dashboard and

the A+ sustainability report. Methods of reporting data are updated as required to meet the needs of industry, government, and the wider community. AQNZ is responsible for ensuring the confidentiality of individual company data and commits to only reporting data in a way where no individual companies can be identified.

Additional AQNZ responsibilities under the SMF include:

- Continuously reviewing the SMF and A+ programme and implementing changes as required to maintain continuous improvement.
- Coordinating or supporting research and development opportunities relating to environmental issues.
- Liaising with environmental NGOs on environmental issues and news relating to aquaculture.
- Supporting industry-led work and initiatives in areas such as biosecurity, animal welfare, decarbonisation, waste reduction, environmental data collection, community engagement, etc.
- Promoting the SMF and the A+ programme for maximum engagement and industry benefit.

4.2 Farmers

Under this SMF farmers are responsible for participating in the A+ programme and committing to continuous improvement of practices.

Farmer participation in the A+ programme requires:

- Full and accurate completion of the annual A+ checklists for the purpose of reporting practices and data and providing feedback.
- Completing external verification assessments as required by AQNZ for the purpose of maintaining programme integrity and gaining valuable feedback on practices.
- Continuous review of practices and genuine effort to progress sustainably over time.

Additional responsibilities under the SMF include:

- Engagement with research and development for the purpose of improving environmental practices.
- Engagement with AQNZ for reporting, feedback, and research.

4.3 Verifier

The verifier is responsible for completion of the external checks as per the objective, target, and indicator criteria outlined in this SMF. AQNZ engages a third-party external verifier of suitable experience each year to complete verification assessments. Completing the Verification Assessments requires the verifier to:

- Complete on-site or online interviews with A+ farmers as requested by AQNZ for the purpose of assessing their practices and the accuracy of the internal checks.
- Provide a technical report to AQNZ summarising their assessment of the subset of farmers each year.
- Maintain confidentiality in reporting and all subsequent communications with and about A+ farmers as per an A+ verifier confidentiality agreement.

Depending on verifier expertise and AQNZ agreements, their role may also include:

- Providing guidance to AQNZ and industry on international trends in certification, best practice, legislation, etc.

4.3.1 Verification Protocol

Verification Assessments usually occur in the July - August period.

AQNZ coordinates assessments with farmers and the verifier. Farmers are contacted early in the year and informed if they are due for verification. Remote-online assessments are occasionally organised where appropriate or necessary. Most assessments are completed on-site.

Our assessor visits our farmers and completes on site verification of their A+ checklist and practices. They are assessed to the indicators outlined in section 6. The assessor will provide AQNZ and the farmers with a confidential report detailing where the targets were met satisfactorily, as well as recommendations for improvement where appropriate. AQNZ uses this report to compile aggregate industry data for public reporting.

Current information about the verifier, verification process, and verification resources can be found at: <http://www.aplusaquaculture.nz/a-verification-assessments>

4.4 Procurement

Under this SMF procurement groups such as processors or retailers can participate on the A+ programme through a commitment to source their aquaculture products from A+ farmers. Compliance with this SMF allows procurement groups to utilise A+ branding on their products if they wish to. This label recognises that 100% of the labelled product is sourced from farmers committed to meeting the standards of this SMF.

To gain an A+ procurement certificate, processors and retailers must:

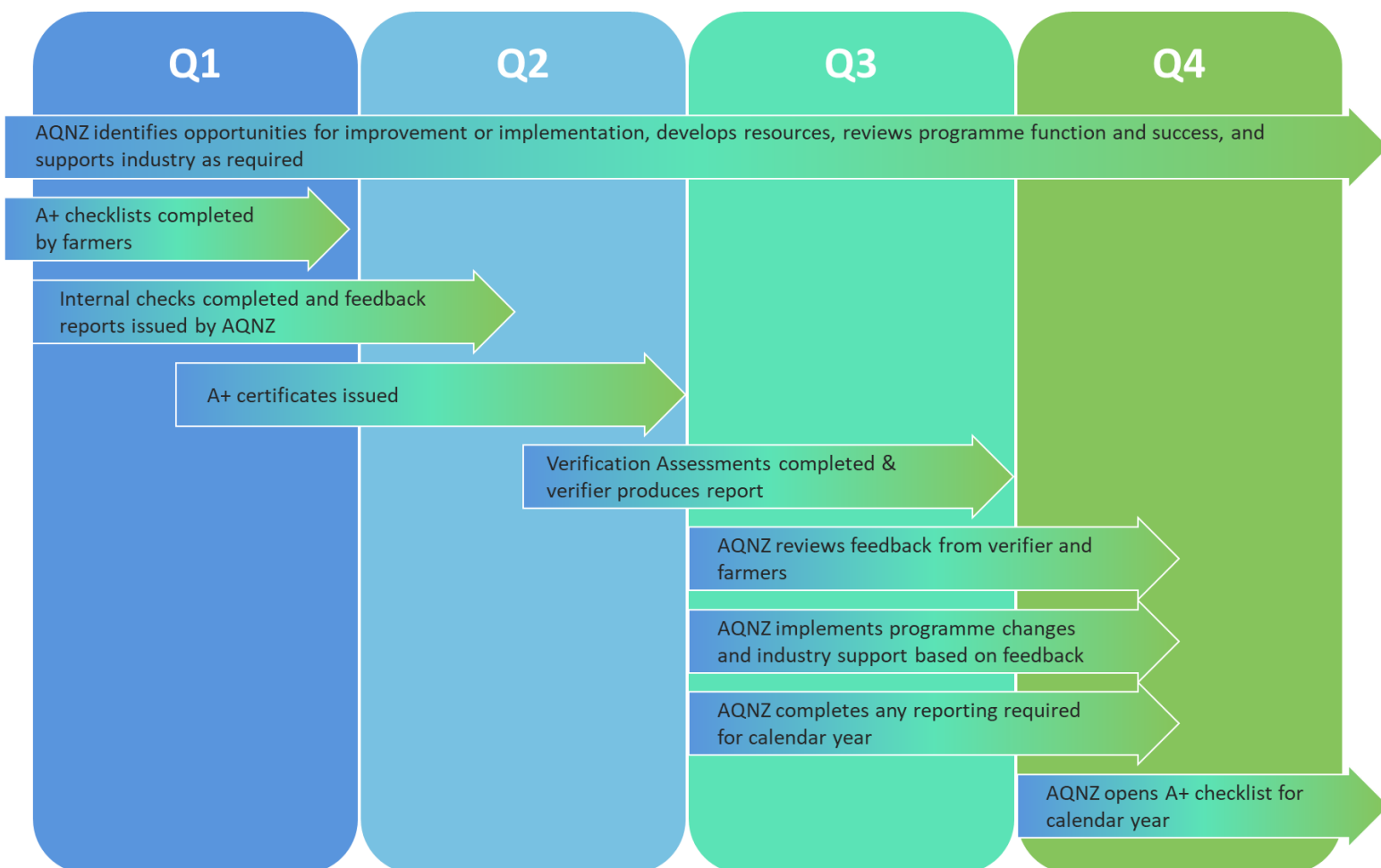
- Supply an up-to-date list of their suppliers each year
- Only source product from A+ farmers

It is also the responsibility of procurement groups to support and ensure the compliance of their suppliers with the A+ programme each year.

5 Programme Timeline & Structure

The SMF is implemented through the A+ programme which facilitates the reporting, checking, and assessment components of the framework. The A+ programme also informs the review process and environmental research and development activities.

Below is a basic outline of the annual structure for the A+ sustainable aquaculture programme.



6 Environmental Objectives, Targets, and Indicators

The following section details the A+ programme objectives, targets, and indicators on which our farmers are assessed each year. These objectives are based on the potential environmental effects identified through an environmental risk assessment (Section 8) and a literature review of the main international environmental standards operating within aquaculture (Section 9). These objectives also consider the NZ aquaculture farming context and legislation (Appendix 2).

The objectives described here provide the foundation for our annual farmer assessments and verification assessments. These are reviewed regularly to ensure they remain accurate and fit for purpose. The programme aims to work with farmers towards the goal of 100% of targets being met.

Some objectives, targets, or indicators are marked to reflect how they are assessed or applied. Not all indicators are assessed by the verifier as they are effectively monitored and regulated under NZ law. Typically, these indicators are assessed through compliance with NZ legislative bodies.

Key:

- * Represents objectives, targets, or indicators that are assessed or reviewed through alternative means and are not verified by the A+ verifier during external checks. These typically include factors that we recognise are important to include in review and reporting, but which are managed and regulated sufficiently by other governing bodies such as local government, Worksafe NZ, etc. It may also represent objectives, targets, or indicators that are beneficial and worth recording and reporting but are not necessary for farmers to be operating under environmental best practice. E.g., International environmental certification, etc.

These objectives, targets, and indicators may be discussed with the verifier for feedback and improvement, but objective evidence is not required.



6.1 Compliance

A requirement for adhering to the SMF is compliance with all legal and regulatory requirements governing aquaculture in New Zealand. Key legislation includes the Resource Management Act 1991 (RMA) and the National Environmental Standards for Marine Aquaculture (NES-MA). Regional Councils and unitary authorities are the primary agents for aquaculture planning and consenting including administering existing coastal permits, allocating coastal space, and assessing aquaculture activity

impacts on fishing and fisheries resources. Full details of the regulations and other legal requirements relevant to the SMF are provided in Appendix 2.

Objective	Target	Indicators
Compliance with all resource consents	100% compliance	100% of resource consents held are current* No consent conditions have been breached or abatement notices issued
Compliance with all other legislation	100% compliance	Records of annual legal non-compliance
To achieve certification to international environmental standards	Target is company specific	Accreditation with environmental standards*



6.2 Ecology

The Greenshell mussel industry recognises the value of the rich biodiversity of the New Zealand marine environment and the need for its protection. In addition, the industry is aware of its interactions with the environment and that they share this environment with a wider community. Operators and industry will employ best environmental practice to manage effects on marine ecosystems.

6.2.1 Te-Oneroa-a-Tōhē Spat

Management of spat is critical to the success and sustainability of mussel farming. Spat management in NZ is relative to our unique native mussel species. The majority of mussel spat supplying farms in NZ comes from wild spat fall on Te-Oneroa-a-Tōhē (90-mile beach) in the top of the North Island. The spat washing up on the beach will not re-enter wild lifecycles and is managed as a fishery (GLM9) under the quota management system (QMS). It is also governed under the voluntary Codes of Practice and Beach Management Board.

Objective	Target	Indicators
Appropriately manage mussel spat collection on Te-Oneroa-a-Tōhē	All spat is collected as per the voluntary Codes of Practice All spat is collected legally under the managed GLM9 fishery	100% of spat sourced from Te-Oneroa-a-Tōhē comes from collectors operating under the Codes of Practice*
Wild spat catching is regulated	All wild spat catching is consented and occurs as per resource consent conditions	100% compliance with consent conditions

6.2.2 Benthic Effects

Seabed (benthic) effects from mussel marine farming operations are associated with the accumulation of sediments and shell litter. This can lead to positive and negative changes in organic enrichment, substrate modification, biodiversity, and ecological function.

Sedimentation and organic enrichment from production of mussels in New Zealand is typically low with a small depositional footprint. Generally, mussel farms are sited over soft sediment habitats where shell litter can even have positive effects forming reef type benthic communities and increased animal abundance. Avoidance of any adverse effects to sensitive habitats is a requirement of the consenting process under the RMA. Management of contaminants and non-organic waste is covered in the pollution and waste sections.

Objective	Target	Indicators
Avoid adverse effects on sensitive benthic habitats	Benthic effects assessments are completed at resource consenting to avoid adverse effects on sensitive habitats	All farms have had a benthic effects assessment during the resource consenting process* Visual monitoring of sensitive benthos* 100% compliance with consent conditions

6.2.3 Biodiversity

The New Zealand Biodiversity Strategy (2000) partly fulfils commitments made under the international Convention on Biological Diversity, ratified in 1993. Biodiversity refers to the diversity of habitats and ecosystems, the indigenous species therein, and the genetic diversity of these species. The key objective of this strategy is to halt the decline of New Zealand’s indigenous biodiversity. The New Zealand Coastal Policy Statement also seeks to protect indigenous biological diversity in the coastal environment. This has broad implications for initial site selection and design during the consenting process and wider farm management.

All objectives, targets, and indicators outlined for biosecurity, wildlife, and benthic health management contribute to maintaining biodiversity in the marine environment.

Objective	Target	Indicators
Natural marine habitats, ecosystems, and rawa are maintained in a healthy, functioning state	Minimise effects on nearby sensitive habitats and marine fauna	Staff awareness of any relevant locations of sensitive habitats. Farm placement and design avoids impacting sensitive habitats*
Industry supports natural ecosystem restoration and protection efforts	Participation in programmes for pest management, habitat restoration, etc	E.g. Participation records or financial evidence*

6.2.4 Biosecurity

Whilst New Zealand is free of some of the pests and diseases found in other countries, It is important for the aquaculture industry and New Zealand that biosecurity is prioritised. Movement of viable genetic material, animal products, and equipment have the potential to transfer diseases and other pathogens. Spat transfer and seed transfer within the industry are a key focus for vector management for pest and disease control.

The industry is potentially affected by a variety of biosecurity threats from external parties, including wild marine life movement, international shipping, and commercial and recreational fishing and boating activities. The NZ aquaculture industry recognises its role in working to minimise the potential biosecurity threats associated with farming operations and movements.

Objective	Target	Indicators
Farming activities do not cause an unacceptable biosecurity risk	Minimise the risk of spreading pests and diseases with inter-regional transfers of equipment, stock, or vessels.	Biosecurity Management Plan that aligns with the requirements of the A+ Biosecurity Standards and the Biosecurity Act 1993 are developed and implemented. Evidence of staff training in biosecurity risk management as per company BMP. Stock transfer records
	Report any suspected new or notifiable pest or disease, or unusual mortality, to the Ministry for Primary Industries as per requirements under the Biosecurity Act 1993.	Biosecurity reporting record - Record of any early notifications of any concerns to the Ministry for Primary Industries

6.2.5 Wildlife

Interactions between naturally occurring wildlife and aquaculture result from an overlap between the spatial location of the farm structures and the habitats and migration routes of the seabirds and marine mammals. Such interactions have been relatively minor issues with New Zealand mussel farms. Potential interactions include entanglement, noise disturbance, vessel traffic, debris entanglement or ingestion, and potential habitat exclusion where facilities overlap habitats or migration routes. Research has found that these impacts are unlikely or aren't seen in NZ, and instead we see positive or neutral interactions between wildlife and mussel farms.

Reporting requirements are outlined by NES-MA, the Marine Mammal Protection Act 1978 (MMPA), and the Wildlife Act 1953 (WA), and are typically addressed in consent conditions.

Objective	Target	Indicators
Marine mammals, seabirds, and other wildlife are not adversely affected by mussel farm operations	Minimise the risk of marine mammal and seabird entanglement.	All entities have a Wildlife Management Plan (WMP) that meets the standards outlined in NES-MA
	Minimise the risks of vessel operation to marine mammals.	A system for recording and reporting Marine mammal and wildlife incidents has been implemented. Staff awareness / WMP training record Avoidance of any relevant key wildlife sites, e.g., breeding colonies.
	Protocols for reporting entangled seals, dolphins, and whales	Report number of incidents



6.3 Water Quality

Water quality is an important component of environmental health that the Greenshell mussel industry depends upon. Operations need to avoid unnecessary discharge of marine debris and contaminants to maintain water quality. Water quality can be impacted by upstream discharges from land use and other coastal activities, so the Greenshell mussel industry also advocates for improvements to water quality management.

6.3.1 Discharges

Potential discharges associated with mussel farm operations can include planned natural discharge, or grey water, bilge water and sewage. Cleaning of lines during harvest creates a discharge or plume of natural material, the effects of which have been assessed as not adverse through the resource consent process. Management of other discharges such as greywater, bilge water and sewage is done via the consenting process.

All discharges to the marine environment are regulated by:

- Regional Coastal Plans;
- Resource Management (Marine Pollution) Regulations 1998;
- Hazardous Substances and New Organisms Act 1996; and,
- Specific Resource Consent Discharge Permits

Objective	Target	Indicators
Discharges to the receiving environment do not have adverse effects	100% compliance with relevant permits and legislation	Number of non-compliances with regards to discharge permits Staff training in management of discharges to marine environment

6.3.2 Pollution

Good management practices can enable avoidance of other diffuse or unintentional sources of pollution such as chemical, oil, or fuel spills, and litter. Spill contingency plans prepared under the Maritime Transport Act describe the actions and responsibilities to contain spills. There are rules under the Hazardous Substances and New Organisms Act for the application, collection, and disposal of antifouling coatings.

Objective	Target	Indicators
Minimise effects of the mussel industry on water quality and pelagic ecosystems	Zero incidences of discharge of chemical, oil, and fuel contaminants	A system for recording and reporting spill incidents is in place.
	Marine farming activities do not degrade water quality	Report number of pollution incidences
	Industry have plans for the prevention and management of spills. Any accidental spills are effectively contained, controlled, and cleaned-up	Evidence of best practice for spill avoidance through appropriate storage and handling of potential pollutants. Staff are trained to respond to spills and have access to appropriate spill kits.



6.4 Waste

The New Zealand Waste Minimisation Act 2008 encourages waste reduction and aims to reduce the harmful effects of waste on the environment. More efficient resource use is achieved through the waste hierarchy or 5Rs (reduce, reuse, recycle, recover, and residual disposal). In order for industry to minimise waste and demonstrate kaitiakitanga the following objectives have been set.

6.4.1 Waste Management

Recording and reporting of solid waste generated by farming operations will enable farmers to identify where and how much waste is being generated, where improvements can be made, what the recyclable component of the waste is, and whether waste reduction targets have been met. In addition, records of waste generated throughout the year will provide information for improved management practices.

Objective	Target	Indicators
Understand the amount and composition of solid waste generated by Greenshell mussel farming operations	Develop a waste recording system	Annual tonnes / year of waste sent to landfill is reported

Minimise the amount of waste generated by the mussel farming industry

Develop a Waste Management Plan

A waste management plan is in place and any actions taken to minimise waste documented

6.4.2 Marine Debris

Mussel farmers have a range of management practices to minimise the discharge of marine debris, including non-natural material such as lashings, ropes, equipment, and general waste directly into the marine environment. Adherence to these is important as accidental discharge of marine debris detracts from the natural character of New Zealand’s coastline. Participation in industry environmental programmes includes regular beach clean ups where farm waste is assessed against total waste to provide an indication of performance.

Objective	Target	Indicators
Minimise marine debris and effects of non-organic waste on the natural environment	No non-organic materials or marine farming debris are discharged to the environment	Best practice methods to reduce non-organic waste are implemented. E.g., Means for collection of rope ties during seeding and spat harvest, movement to clamp systems, etc. Evidence of staff training to reduce waste to marine environment Number of complaints from residents received regarding the level of debris on the beaches
	All marine farms are actively involved in beach clean ups	Number of clean up events participated in Record tonnes / year and observe reduced percentage of the total waste collected of marine debris attributable to marine farms*

6.4.3 Zero Waste & Recycling

The target of zero waste is an aspirational goal of maximum resource efficiency, where no waste is created and all resources are either reused, recycled, or composted. This provides targets for innovation and best practice technology to design waste out of the processes. Opportunities for recycling, repurposing, and reduction will be considered and appropriate programmes put in place to reduce both organic and non-organic waste to the marine environment and landfill.

Objective	Target	Indicators
To reduce, repurpose, or recycle all material as is appropriate	All floats will be repaired, repurposed, or recycled All other farming materials such as ropes will be repaired, repurposed, recycled, or replaced with	Evidence of recycling, composting, and waste reduction programmes

	<p>environmentally friendly options wherever possible</p> <p>Maximise the repurposing of biological byproducts from farming wherever appropriate – E.g., Shells</p>	
Actively work towards a zero-waste target as an industry	<p>Contribution to, or participation in research, initiatives, or programmes focussed on reducing farm waste</p> <p>Continuous improvement of practices for reducing farm waste</p>	<p>Tonnes of waste per year to landfill</p> <p>Evidence of best practice to reduce organic waste, e.g., management practices to reduce build-up of biofouling</p> <p>Evidence of best practice to reduce non-organic waste, e.g., utilisation of most appropriate materials to suit marine farm conditions</p>



6.5 Resources

Efficient use of resources allows operators to reduce the risk and increase the resilience of the environment that they operate in. This includes considering the most efficient use of resources such as non-renewable energy supplies. In addition, an appreciation of the ecosystem on which aquaculture relies means that assets are used in the most efficient way to minimise the impact on the environment and on other users of the space. Placing a value on ecosystem services from the perspective of all users also provides a platform from which policy makers can better plan for

sustainable use of the environment.

6.5.1 Farm Structures & Equipment

Many of the assets related to the Greenshell mussel industry are located or used in the marine environment (marine farm structures). Structures should be fit for purpose and installed and maintained so as to minimise the effects on the surrounding environment. This includes containment of stocks, the ability of assets to last in changing conditions, location of structures, and minimising visual impact. Much of this is regulated through the farm consenting process. In addition, equipment and machinery should be maintained to reduce the risk of breakage and associated pollution. Contingency plans must be in place to deal with unforeseen events such as major storms, tsunamis, etc.

Objective	Target	Indicators
To reduce the impact of structures and equipment on the natural environment	No adverse impacts from farming structures on sensitive or protected aquatic ecosystems	100% adherence to farm structure, maintenance, & inspection consent conditions (no non-compliance)
To reduce the impact of aquaculture activities on the environment caused by an emergency event	<p>100% of farms have a contingency plan in the event of structural damage or loss</p> <p>All staff are aware of emergency procedures</p>	<p>Evidence of contingency plan.</p> <p>Evidence of training in emergency management</p> <p>Maintenance & inspection records</p> <p>Complaints records</p>

Farms are maintained to minimise structural damage or loss

Substantial gear is labelled so that it can be traced to the farm of origin*

6.5.2 Navigation

Farms must be marked in accordance with regional council consent requirements and the Maritime Transport Act 1994 to identify potential navigation hazards at night. The Maritime NZ “Guidelines for Aquaculture Management Areas and Marine Farms” outlines relevant navigational issues and criteria.

Objective	Target	Indicators
To minimise navigational hazards surrounding marine facilities	Comply with navigational plans with councils or authorities	Records of maintenance of farm structures, lighting, and buoys
	Maintain all structures so as not to create a navigational hazard	Record of complaints related to navigation
	Maintenance of all lights & buoys in compliance with the marine farm lighting and marking plan	No consent conditions have been breached or abatement notices issued

6.5.3 Energy

Farm operations should occur with a view to constantly improving efficiencies when using energy resources such as electricity and fuel. Where possible, industry should be striving to switch to renewable or environmentally friendly alternatives to non-renewable sources.

Objective	Target	Indicators
To minimise the use of non-renewable energy resources	Monitor fuel usage and always operate with consideration of energy efficiency	Records of fuel usage
	Use of best available technology for clean energy.	Active steps towards adopting or developing clean energy options.



6.6 Food Safety

Food safety is important throughout the supply chain to ensure the safety of the product for consumption. Issues of food safety and Sens are addressed to the highest standard in order to reassure consumers that they are receiving the best quality products. From 1 January 1993, it has been mandatory that all bivalve shellfish must be grown, harvested, transported, and processed in accordance with an industry agreed standard, IAS 005: Shellfish Quality Assurance. This programme has become formally established under the Animal Products Act 1999 as a Regulated Control

Scheme for Bivalve Molluscan shellfish (BMSRCS) Notice 2006. This standard is administered by the Ministry for Primary Industries. All farmers must adhere to the BMS-RCS. Strict monitoring programmes and record keeping also help manage issues around environmental or pollution effects which may affect filter feeders such as mussels.

Objective	Target	Indicators
Ensure all products are safe for human consumption	100% compliance with the BMS-RCS	No non-compliance Staff training records for harvesting and adherence to the BMS-RCS BMS-RCS records

6.6.1 Animal Health & Hygiene

Aquaculture facilities and operations should maintain good culture and hygienic conditions to mitigate against disease in stock and products. Additionally, animal health should be maintained to the highest possible standard as low welfare is associated with poor product quality and disease.

Objective	Target	Indicators
To maintain hygienic conditions	100% compliance with the BMS-RCS No sewage discharged at farm sites	All conditions of harvesting criteria are met in accordance with the BMS-RCS
Strive to maintain high stock health	Best practice for maintaining stock health and survival followed at all life stages.	Records of shellfish health, disease, and mortality monitoring Biosecurity management plan meeting the requirements of the industry biosecurity standards (biosecurity and stock welfare practices align)

6.6.2 Traceability

Traceability of farming activities and inputs which impact food safety should be assured. The ability to trace stock location and inputs throughout the entire lifecycle enables farmers to identify source points for any product issues and prevent harvest of unsuitable product. It also facilitates the prevention of disease spread.

Objective	Target	Indicators
To maintain robust stock records	Ability to complete full trace back exercises on all stock as required.	Records of all stock movement, inputs, locations, and harvest, throughout full life cycle.



6.7 Iwi Participation

Iwi consultation is a key component of the consenting process for marine farm development in Aotearoa. Māori rights to ownership and involvement in commercial kai moana ventures are protected as per Te Tiriti o Waitangi. Additionally, all farm operations should be designed and operated to have regard to sites of special significance to Iwi and to traditional harvesting practices of mahinga kai.

Māori have a strong commitment and involvement in the Greenshell mussel industry, and tikanga Māori is integrated into farms owned and operated by Māori. Joint ventures between Māori and other Greenshell mussel industry members are now resulting in the influence of Māori tikanga spreading beyond Māori owned farms. This standard encourages ongoing engagement between all farmers and their local Iwi.

Objective	Target	Indicators
To work collaboratively to sustainably deliver the bounty of the sea (kotahitanga)	<p>Fish and shellfish communities relied upon by local Iwi are not impacted by the farm activities</p> <p>To minimise farm impacts on the ecosystem that the aquaculture harvest and Iwi draw on (rawa)</p>	<p>During consent application, meetings with local Iwi are held to share knowledge and monitor Iwi concerns*</p> <p>Ongoing engagement with local Iwi is encouraged*</p>



6.8 Community

All farm operations should be designed and operated to co-exist with the local community and to minimise negative impacts to the local community and coastal marine users.

6.8.1 Communication

The mussel industry shares the marine space with many other users including the boating community, commercial and recreational fishers, and the community at large. Good communication with these key stakeholders can foster a culture of open discussion and mutual understanding. Efforts to create this environment include community participation, feedback procedure, and communication strategy.

Objective	Target	Indicators
To present a good public image for the industry and show respect for other persons, communities, and stakeholders	<p>Industry maintains a positive reputation with communities.</p> <p>Negative feedback is met with timely response and appropriate actions</p>	<p>Farmers are represented at relevant community meetings and events*</p> <p>Economic contribution to local community including employment, procurement, and community investment</p> <p>System for recording complaints from local residents, stakeholders, or other relevant organisations</p> <p>Procedure for responding to complaints</p>

Demonstrate community outreach and engagement (meetings, newsletters, etc.) *

6.8.2 Visual Impacts

Aquaculture developments should respect the character and diversity of their landscape setting by minimising the visual impact of the development.

Floats are the most visible structure for mussel farming and mitigation measures such as alternative design, float colour, structure, and shape can reduce these effects. Other impacts include minimising any nuisance to the local community caused by lighting. Yards should also be kept tidy as they can impact the aesthetic value of land-based sites and shorelines.

Objective	Target	Indicators
Maintain aesthetic values of the farm environment and immediate surrounds	100% of farms and barges are kept in a tidy condition	Complaints record from local residents, stakeholders, or other relevant groups relating to visual impacts.
	Visual impacts are minimised	No non-compliance notices relating to visual impacts
	100% of yards are kept in a tidy condition	Complaints record from local residents, stakeholders, or other relevant groups relating to visual impacts.
		No non-compliance notices relating to visual impacts
		Opportunities realised to improve aesthetic values (within the boundaries of compliance with consent)*

6.8.3 Noise and Odour

Noise in the coastal area is governed by noise bylaws or Noise Emission Standards in Regional or Coastal Plans. Aquaculture operations can produce odours, mostly associated with organic waste and waste organisms being exposed to the air, which may be offensive to some people. All such waste should be stored and disposed of in a considerate manner to minimise such disturbance.

Objective	Target	Indicators
All operational noise and odours will fall within acceptable limits and not cause a public nuisance	Noise producing equipment will be shielded, enclosed, or replaced with low-noise emitting equipment	Identification & mitigation of all sources of noise
	Noise pollution will be managed	Records of complaints from local residents / stakeholders and responses
		Evidence of a process to manage noise pollution, e.g., operational windows

Offensive odours are strictly managed and minimised

Records of complaints from local residents / stakeholders and responses

Evidence of a process to manage odour or odour producing waste

6.8.4 Employee Welfare

Mussel farming in New Zealand is required to be conducted in a socially responsible manner, within New Zealand’s employee welfare rules and regulations. Additional guidance for the responsible treatment of workers includes the International Labour Organisation agreements and the United Nations Universal Declaration of Human Rights.

Mussel farming contributes to rural development, enhances benefits and equity in local communities, alleviates poverty, and promotes food security. As a result, socio-economic issues should be considered at all stages of aquaculture planning, development, and operation.

Employee health and safety is a key priority and is regulated under New Zealand health and safety legislation. A number of additional regulations and approved codes of practice have been developed to manage hazards in the workplace including the Maritime Operator Safety System (MOSS).

Objective	Target	Indicators
To be fully compliant with health and safety law and maintain safe practices.	<p>Zero incidences of serious injury or harm in the workplace</p> <p>Full compliance with relevant health and safety regulations and other employment legislation</p>	<p>Annual reported incidences of accidents and injury in the workplace</p> <p>Health & Safety plan compliant with health & safety regulations implemented and regularly reviewed</p> <p>All staff receive appropriate training for the job</p> <p>Steps taken to reduce notifiable injuries</p>
To maintain high workplace satisfaction and staff wellness	Implementation of wellness initiatives and policies supporting staff retention & perceptions	Initiatives and policies for improving staff wellness, diversity, mental wellbeing, job satisfaction, physical health, or other benefits.

7 Operational Procedures

Summary of farm operations, processes, and equipment that can be managed via best practices to achieve identified objectives and targets. The operational procedures are organised in relation to the Greenshell mussel production process – from establishment of mussel farm through to harvest and employee management practices.

Note that the following are established procedures that can be used by farmers to contribute to the objectives, targets and indicators in this SMF. They represent a baseline for meeting acceptable standards and do not preclude the opportunity for farmers to innovate or for new best practices to be identified and added to this SMF.

Marine Farm Operation	Environmental Aspect and Overview	Management Practices
<h2>7.1 Establishing Mussel Farms</h2>		
<p>Ecological Assessment of Proposed Site</p>	<p>NZ Legislation has strict controls around the establishment of marine farms. When applying for resource consent an applicant is required to provide a variety of information including an ecological investigation of the proposed marine farm area and the biological features and fisheries resources of the adjacent coast.</p> <p>This environmental assessment process, ensures mussel farms are appropriately positioned relative to habitats, species or communities of high ecological, scientific or fisheries value.</p>	<ul style="list-style-type: none"> • Industry shall support the use of appropriate guidelines (from the relevant regional council and MPI) for ecological investigations of proposed sites to ensure that assessments contain the appropriate type and level of information and meet scientific reporting standards. • When applying for resource consent all required assessments of environmental effects are undertaken.
<p>Location and Navigation</p>	<p>Resource consent applications include the boundary of the consent area for new farms or extensions of existing farms on a site plan using map coordinates. Applicants may propose an adjustment to the size or position of the farm during the resource consent assessment process to avoid environmentally or ecologically sensitive features.</p> <p>It is important that all farm structures are located as shown within the boundaries designated within the final resource consent. Most consents will stipulate how farm boundaries are to be established, most commonly by a registered surveyor using DGPS to ensure the farm is within the boundary stipulated in the consent.</p> <p>Failure to locate farms as per the consent may result in adverse effects on ecological values or navigational safety.</p>	<ul style="list-style-type: none"> • Use appropriate methods to accurately place farm structures. • Locate farm structures in compliance with your resource consent.
<h2>7.2 Farm Structures and Management</h2>		
<p>Anchoring Systems</p>	<p>Anchoring systems are detailed in resource consents.</p> <p>Currently, concrete block, screw and steel Danforth anchors are used to secure surface structures.</p> <p>Danforth anchors are used for seasonal spat catching sites where resource consent conditions require all equipment to be removed at the end of the season.</p> <p>Movement of farm anchoring systems may move parts of the farm outside of the area of resource consent, potentially affecting sensitive environments or creating a navigational hazard.</p>	<ul style="list-style-type: none"> • Use anchoring systems as approved by resource consent • Correct placement inside consented area to approved standards (best industry practice using accurate GPS co-ordinates) • Choose the most appropriate anchoring system for the conditions to ensure farm structures do not move beyond consented area
<p>Warp and Backbone Ropes</p>	<p>Anchor warp and backbone or longline ropes are synthetic ropes designed to last for long periods with only minimal maintenance.</p>	<ul style="list-style-type: none"> • The design and operation of structures and equipment should minimise risk of entanglement of marine mammals and other wildlife

Marine Farm Operation	Environmental Aspect and Overview	Management Practices
	<p>Loose, floating free ropes present the greatest risk of entanglement to marine mammals.</p> <p>Ensuring backbone lines are appropriately tensioned and debris is not discharged to the marine environment will reduce this risk.</p> <p>Similar to anchor design, the choice of rope diameter must reflect local conditions such as tidal current and wave action.</p> <p>Development of ropes that are resistant to settlement of encrusting organisms would reduce the deposition of material onto the sea floor and cleaning costs to the farmer.</p>	<ul style="list-style-type: none"> • Farm structures and equipment are maintained and there are no free or loose floating lines or ropes that increase entanglement risk • Ensure warp and backbone ropes are of a sufficient specification and condition to prevent breaking under prevailing environmental conditions • Do not dispose of any inorganic material into the marine environment • Maintain all structures to ensure that they are restrained, secure and in working order at all possible times so as not to create a navigational hazard • Encourage and support initiatives to minimise inorganic waste entering the marine environment, for example: Improving farm design and structures to reduce loss of materials (e.g., attachment of floats to backbones) • Explore new or innovative methods to re-use or recycle mussel farm materials. • Inform AQNZ of novel opportunities for re-use and recycling of mussel farm materials to ensure these are shared across industry.
<p>Procedures Following Line Breakage/Sinkage or Anchor Failure</p>	<p>Occasionally longlines move out of position due to a break in a warp or backbone line or an anchor failure. These breaks or failures are rare, but can occur for a variety of reasons including chafing, line fatigue, strong tidal currents, storm events, or tsunamis.</p> <p>Depending on where the break occurs, structures can swing into or away from the other surface lines. This can result in floats either fouling adjacent lines, floats trailing away from the farm or line sinkage and subsequent loss of materials to the marine environment.</p> <p>Farmers should develop an emergency response plan to guide recovery and repair of farm structures in the event of structural damage or failure.</p>	<ul style="list-style-type: none"> • Follow your emergency response plan to guide recovery and repair of structures • During an emergency response all efforts should be made to not dispose of any inorganic material into the marine environment
<p>Navigation Lights, Reflectors, and Float Markings</p>	<p>Maritime New Zealand is responsible for assessing navigational related matters during resource consent applications, and for prescribing standards and</p>	<ul style="list-style-type: none"> • Locate, install and maintain navigational aids in accordance with your resource consent

Marine Farm Operation	Environmental Aspect and Overview	Management Practices
	<p>requirements for navigational aids. Often this function will be delegated to the regional Harbourmaster.</p> <p>The farm must comply with the relevant resource consent navigation, lighting and float marking conditions.</p> <p>Failure to comply with navigational requirements may lead to impacts on other users of the Coastal Marine Area.</p>	<ul style="list-style-type: none"> • Take all practical steps to find and retrieve any marine farming structures that become dislocated into the marine environment • Should any part of the marine farming structures be dislocated into the marine environment that is of a size that could constitute a navigational or safety hazard inform the Harbourmaster and Maritime New Zealand immediately. • Advise other mussel farm operators of any observed non-compliance of their mussel farm structures • Inform the Harbourmaster of any known failures of mussel farm navigational aids • Permanently brand each buoy within the mussel farm with owner's/operator's identification mark • Inform the regional council/unitary authority if you cease to mussel farm in an area authorised by resource consent
Visual Impact	<p>Mussel floats are the most visible part of a mussel farm. The number and placement of orange floats is usually stated in resource consent conditions and dictated by navigational requirements. The number of black floats used varies depending on the growth stage of each crop, the purpose of the farm and farm management practices. During mussel holding and production stages, considerable growth of mussels occurs and extra black floats are frequently added to lines to offset the weight increase.</p> <p>Float management during crop growth has implications for the visual impact of mussel farms. However, visual impact is influenced by other factors such as weather conditions, distance of viewer from the farm and the number of orange navigational floats.</p> <p>Detached floats (damaged or otherwise) can have visual impact if not retrieved for repair or disposal on land.</p>	<ul style="list-style-type: none"> • Locate structures and boundaries in compliance with your resource consent • Ensure that routine maintenance procedures include practices to keep farm floats tidy and well maintained • Permanently brand each buoy within the mussel farm with owner's/operator's identification mark • Participate in beach clean-up efforts and float retrieval programmes • Actively work to reduce float loss including adoption of new float attachment methods
Wharves / Marinas / Jetties	<p>The mussel industry often shares wharves or jetty facilities with other users. Public users may include fishing, walking and vessel access. New and improved facilities can be an asset to the local community especially if designs provide for safe public access.</p>	<ul style="list-style-type: none"> • Consider public access in design of all new and redeveloped marine facilities (e.g. wharves, jetties), where appropriate and safe. • Industry will give due consideration to public safety, where public have access and /or share wharf facilities.

Marine Farm Operation	Environmental Aspect and Overview	Management Practices
<h3>7.3 Vessel Operation</h3>		
<p>Navigational and operational incidents</p>	<p>All commercial vessel operators are required to comply with Maritime Safety regulations (e.g., Maritime Transport Act 1994), including maintaining a register of accidents, incidents and mishaps.</p> <p>All navigational and operational incidents should also be recorded in a ships log. Maritime NZ must be notified as soon as practicable of any incidents involving commercial vessels.</p> <p>All commercial vessel operators are required to report to ships in the vicinity, and the nearest radio communication station with which it is possible for the ship to communicate, any danger to navigation, including the failure or displacement of any navigational aid.</p>	<ul style="list-style-type: none"> Records in the ships log any details of any navigational incidences in relation to navigation or vessel operation as per the Maritime Transport Act 1994. Record time of incident, vessels involved, any injuries or damage, and actions taken. As soon as possible after a navigational or operational incident, report it to the Maritime NZ Rescue Coordination Centre (RCCNZ). 24-hour emergency number: 0508 472 269 As soon as possible after that report the incident to the Harbourmaster
<p>Speed</p>	<p>Vessel speed in particular areas and under certain circumstances is often regulated. Under normal operating circumstances, vessels can still impact recreational craft and beaches. Maritime Safety Rules Part 91 (Navigation Safety Rules) under the Maritime Transport Act 1994 prohibits vessels from travelling at a speed exceeding five knots within 50 m of any other vessel, raft or person in the water or within 200 m of the shore, any structure including marine farming structures and from diving activities.</p> <p>Environmental aspects of speeding might include disturbance of other users of the coastal marine area and effects (e.g., wake) on marine ecosystems.</p>	<ul style="list-style-type: none"> Operate mussel vessels in accordance with Maritime Rules abiding by speed restrictions When any navigational speed related issues arise, work cooperatively with the Harbourmaster to resolve those issues Be cognisant of effects of speeding on wider environment and other users (i.e. effects of wake).
<p>Noise</p>	<p>Vessel noise can disturb other users of the coastal marine area and nearby communities.</p> <p>Noise in the coastal area is governed by Noise Bylaw or Noise Emissions Standards in Regional or Coastal Plans. The operation of vessels often results in the production of localised noise. Harvesting activities result in noise which may travel considerable distances in the marine environment especially at night or on calm days. The level of noise generated varies depending on the vessel and the activities being undertaken and noise transmission also varies depending on location and weather.</p>	<ul style="list-style-type: none"> Operate mussel vessels in accordance with Maritime Rules, abiding by speed restrictions Limit noise emission in sensitive areas where practical (e.g. be aware of VHF use or loud music playing around nearby communities) Abide by any relevant Marine Farming Noise Code of Practices

Marine Farm Operation	Environmental Aspect and Overview	Management Practices
	<p>Noise associated with mussel farming work such as radios (stereos and VHF) and harvesting activities could impact on other users of the Coastal Marine Area and local residents, particularly when harvesting is conducted outside of daylight hours.</p> <p>In accordance with Section 16 of the Resource Management Act, every person carrying out an activity in the Coastal Marine Area must adopt the best practicable option to ensure that the emission of noise does not exceed a reasonable level.</p>	
<h2 style="color: #4CAF50;">7.4 Wildlife</h2>		
<p>Wildlife Incident Contingency Plan</p>	<p>It is important that mussel farm operators know how to respond in a timely manner to the discovery of or other incident involving marine mammals or other wildlife (e.g seabirds).</p>	<ul style="list-style-type: none"> • All incidences of marine mammals or seabirds becoming entangled in or observed to be affected by ingestion of marine farming equipment, lines, or debris are recorded • All incidences of marine mammal entanglements are reported to DOC within 24 hours of observation including identification of the species and a description of the event • Immediate notification of DOC of all entanglements of whales where the whale is alive. Report all other incidents involving marine mammals to DOC as soon as practicable
<p>Marine Mammals</p>	<p>Best practice farming and vessel operations can reduce the risk of harm to marine mammals</p>	<ul style="list-style-type: none"> • All marine farmers are aware of and comply with the Marine Mammal Regulations 1992 with respect to vessel speeds, approach angles and proximity to marine mammals • All vessels servicing marine farms display in a position visible to the skipper, the DOC sticker setting out vessel rules in relation to approaching marine mammals • Additionally, all vessels should abide by the rules detailed in the DOC pamphlet “Sharing our Coasts with Marine Mammals” (refer to pamphlet for further information).
<p>Seabirds</p>	<p>Best practice farming and vessel operations can reduce the risk of adverse effects to endangered seabirds.</p> <p>Reporting requirements vary by region based on species of interest in farming areas. Regional councils set reporting and recording requirements in resource consents in relation to local species.</p>	<ul style="list-style-type: none"> • Vessels are kept at least 100m away from known roosting sites / colonies of endangered seabirds (e.g. king shag) • Farmers must adhere to the recording and reporting set out in resource consents.

Marine Farm Operation	Environmental Aspect and Overview	Management Practices
<h2 style="color: #4CAF50; margin: 0;">7.5 Spat</h2>		
<p>Spat Catching</p>	<p>Spat collection in New Zealand is undertaken on Te Oneroa A Tōhē (90 Mile Beach), Northland. Mussel spat from extensive offshore mussel beds settle on drifting seaweed that periodically washes up on to the beach. These “spat falls” range in weight from a few kilograms to tonnes and occur approximately 30-40 days per year.</p> <p>Spat collectors use four-wheel drive vehicles and trailers to collect the spat-covered seaweed, which is then transported by air or road freight to mussel farmers.</p> <p>Spat collecting from 90 Mile Beach requires a fisheries permit under the Fisheries Act 1996 and is managed under the QMS quota allocation scheme to ensure sustainable use.</p> <p>A voluntary ‘GLM9 Advisory Group’ has established a GLM 9 Management Plan to promote best practices to operate in an environmentally sustainable manner.</p> <p>In accordance with the current Northland Regional Coastal Plan, resource consent (coastal permit) is not required for collecting seaweed containing spat.</p> <p>Compliance with fishing permits and the voluntary GLM 9 Management Plan is important to minimise effects.</p>	<ul style="list-style-type: none"> • Follow the requirements of the Fisheries Act when applying for fisheries permits • Ensure compliance with the GLM 9 Management Plan
<p>Rope Caught Spat</p>	<p>Catching spat on rope involves the placement of a specialised culture rope into the water column during periods when and where spat are known to settle. In some cases, spat catching farms are temporary structures, and are removed after a spat catching season.</p> <p>Spat catching is only allowed on sites where this activity is permitted by a Resource Consent under the Resource Management Act 1991.</p> <p>The industry most commonly uses internally weighted core rope to catch spat as it does not require an additional weight. In some cases, weighted bags are used to keep spat lines taut.</p>	<ul style="list-style-type: none"> • Secure all mussel spat catching structures using best industry practise to prevent loss to the environment • Use spat catching methods that avoid weights but if used ensure that they are retrievable • Wherever possible repair and reuse materials and equipment as an alternative to disposal (e.g. rope, floats) • Where not possible to repair or reuse, retain inorganic materials on board for appropriate disposal on land • Inform AQNZ if you identify any new or innovative methods to re-use or recycle spat farm materials
<p>Seeding</p>	<p>Spat are seeded onto grow-out rope using a cotton-blend stocking (e.g. mussock). The stocking ensures spat are held close to the rope to enable spat to attach. Seeding stocking is manufactured in various biodegradability classes. Stocking with</p>	<ul style="list-style-type: none"> • Use stocking with the highest practicable percentage of biodegradable material when seeding out mussel spat

Marine Farm Operation	Environmental Aspect and Overview	Management Practices
	<p>a higher component of non-biodegradable material is required in areas of high wave action, tidal currents and certain times of the year (due to speed of cotton decay).</p> <p>During seeding, ties (short length of rope) are used to attach dropper lines to backbones.</p> <p>Environmental effects may occur if farm materials are lost to the marine environment, so all efforts should be made to retain these.</p> <p>Local industry have developed Environment Programmes and Codes of Practice to guide best practice to minimise environmental effects.</p>	<ul style="list-style-type: none"> • Retrieve inorganic farm waste (e.g. ties, floats, ropes, droppers, anchors) no longer required from the marine environment for appropriate disposal on land • Do not dispose of rope ties into the marine environment • Secure all mussel farm materials according to best industry practise to prevent loss to the environment • Wherever possible repair and reuse materials and equipment as an alternative to disposal (e.g. rope, floats) • Inform AQNZ if you identify any new or innovative methods to re-use or recycle mussel farm material • Participate in local industry Environment Programme
<h2 style="color: green;">7.6 Biosecurity</h2>		
<p>Biosecurity</p>	<ul style="list-style-type: none"> • See industry biosecurity standards for more detail: A+ Standards and BMP Templates can be found here: 	<ul style="list-style-type: none"> • Develop and implement an on-farm biosecurity management plan (BMP) that meets the requirements of the A+ Biosecurity standards and any relevant resource consent conditions. • BMP's are required to include details of risk management controls relating to biosecurity risks associated with: <ul style="list-style-type: none"> ○ People ○ Waste / Disposal ○ Stock health, surveillance and record keeping ○ Movements and transfers of stock, vessels, vehicles, equipment ○ Training ○ Response and Reporting
<p>Biofouling - Over-settlement of non-target species on mussel lines</p>	<p>Species other than Greenshell mussels frequently settle and grow on the spat catching lines (e.g. blue mussels, Pacific oyster).</p> <p>Subject to consent conditions, over settled species may be discarded into the marine environment, harvested and sold as by products or graded out at a processing factory and disposed to landfill.</p>	<ul style="list-style-type: none"> • Minimise biofouling by adopting best farming practices, including regular maintenance of farm structures and cleaning of equipment to minimise the build-up • Inform AQNZ if you identify any new or innovative methods to utilise biofouling

Marine Farm Operation	Environmental Aspect and Overview	Management Practices
		<ul style="list-style-type: none"> Report any suspected new or notifiable pest (e.g. Sabella) to the MPI Exotic Pest and Disease Hotline 0800 80 99 66
<h2>7.7 Food Safety and Water Quality</h2>		
<p>Food Safety and water quality</p>	<p>In New Zealand it is mandatory that all bivalve shellfish harvested for human consumption, including mussels must be grown, harvested, transported and processed in accordance with the Bivalve Molluscan Shellfish Regulated Control Scheme (BMS RCS). This standard is administered both regionally and centrally by the Ministry for Primary Industries.</p>	<ul style="list-style-type: none"> Farmers must comply with the BMS RCS
<h2>7.8 Waste Management</h2>		
<p>Inorganic Waste</p>	<p>Mussel industry activities have potential to generate inorganic waste and debris (e.g., ropes and ties) if not appropriately managed.</p> <p>If rope or other inorganic waste is lost overboard it may negatively impact the marine environment.</p> <p>All efforts should be made to reduce inorganic waste loss to the environment.</p>	<ul style="list-style-type: none"> Do not dispose of any inorganic waste into the marine environment Maintain all structures to ensure that they are restrained, secure and in working order at all possible times so as not to create a navigational hazard Encourage and support initiatives to minimise inorganic waste entering the marine environment, for example: Improving farm design and structures to reduce loss of materials (e.g., attachment of floats to backbones) Explore new or innovative methods to re-use or recycle mussel farm materials. Inform AQNZ of novel opportunities for re-use and recycling of mussel farm materials to ensure these are shared across industry.
<p>Potential chemical and effluent discharges into the Marine Environment</p>	<p>If chemicals spill and enter the marine environment, impacts may occur on marine ecology.</p> <p>Mussel industry activities at marinas or wharves also have potential to generate pollution if not appropriately managed. Activities with potential to create pollution include bilge water discharge, cleaning, unloading and hull maintenance.</p> <p>Because water quality is critical to mussel production, the industry requires all users to minimise the discharge of pollutants or sewage into the marine environment.</p>	<ul style="list-style-type: none"> Abide by the requirements of the Regional Coastal Plan and the Resource Management (Marine Pollution) Amendment Regulations All industry vessels to have holding tanks or portable toilets and use port facility sewage pump where available and encourage port authorities to provide pump out facilities where they are not already provided

Marine Farm Operation	Environmental Aspect and Overview	Management Practices
		<ul style="list-style-type: none"> • Other than those authorised, ensure that the discharge of chemicals or effluent to the coastal marine area is minimised. • Adopt good management practices in relation to storage and use of chemicals on board. • Store chemicals in contained areas (to avoid spills into the marine environment or bilge system) • Keep a spill kit with appropriate absorbent material on board to absorb on board spills • Display the pollution hotline for the regional council on board and notify all spills • Use biodegradable cleaning and degreasing compounds to clean vessels
Diesel, Fuel or Oil Spills at Sea, in Marinas or at Wharves and Jetties	If oils or fuels leak or spill and enter the marine environment, impacts may occur on marine ecology.	<ul style="list-style-type: none"> • Refuel at approved areas and supervise refuelling at all times • Display the pollution hotline for the regional council on board and notify all spills • Keep a spill kit with appropriate absorbent material on board to absorb on board spills • Vessels to carry out spill drills with all crew • Use biodegradable oils in hydraulic systems
7.9 People and Staff		
Training	<p>Supervisors should be alert to the range of training opportunities available within New Zealand. Staff who are trained to be technically competent are less likely to make mistakes that will result in an environmental incident or a safety incident.</p> <p>Training can prevent incidents resulting in environmental impacts which may prove costly to companies in both clean up expenses and bad publicity.</p> <p>NZQA work-based training courses can be accessed through the New Zealand Industry Training Organisation (NZITO). This includes two levels of training in Environmental Best Practice.</p>	<ul style="list-style-type: none"> • Farmers will consider training opportunities including: <ul style="list-style-type: none"> ○ Health and Safety ○ Pollution Response ○ Biosecurity ○ Wildlife Management ○ Sustainability and Waste Management

Marine Farm Operation	Environmental Aspect and Overview	Management Practices
Health and Safety	<p>Vessel operators should have appropriate skippers qualification for the size of the vessel being operated and should carry lifesaving and emergency equipment appropriate for the vessels and as per MOSS requirements.. Onboard communication systems (eg cellphone & VHF Radio) is important.</p> <p>First aid equipment and access to first aiders is required by regulation. It is recommended that at least one worker is trained in first aid, and that one worker is nominated as a safety officer.</p> <p>The industry has developed Diving Best Practice guidelines in collaboration with Work Safe NZ, these are available here:</p>	<ul style="list-style-type: none"> • Farmers must abide by Maritime New Zealand requirements (Maritime Operator Safety System (MOSS)), and the Health and Safety at Work Act 2015 • All workers must be provided with first aid facilities, equipment, and access to first aiders. • All operators must operate under a Health and Safety plan which complies with the Health and Safety at Work Act 2015. • Farmers should uphold the New Zealand Aquaculture Industry Diving Best Practice Guidelines
Community participation	<p>Farmers should aim to be recognised as good neighbours in accord with this SMF including by participation in the local community.</p> <p>Community participation could include: know your adjoining property owners and give them your phone number, contribute/join/sponsor/initiate harbour cleanups, talk to environmental groups, be proactive with water quality including by joining RMA processes (consents, planning processes), promote local food festivals, farm open days.</p> <p>Farmers can also gain recognition for the many benefits created by marine farming including; jobs, income, fisheries enhancement, water quality promotion, quality seafood production.</p>	<ul style="list-style-type: none"> • Farmers comply with this SMF • Farmers actively participate in the community • Systems are in place for managing community interactions, including acknowledging, recording, and responding to any complaints.

8 Environmental Risk Assessment

This risk assessment investigates the various potential environmental impacts from mussel farming in order to quantify the degree of potential risk associated with each factor. This assessment underpins the SMF structure and content. Many of the risk factors assessed are highly regulated under NZ law and are not dictated by the farmers themselves. The environmental risk assessment below should be reviewed regularly and updated according to new research and best practice approaches for environmental risk management.

An environmental risk assessment of the potential effects of mussel farming operations on natural ecosystems. Total scores are generated by summing the potential contributing factors of cost, scope, severity, legislation, and controllability. Scores between 19 - 25 = high risk (red), 12 - 18 = medium risk (yellow), 5 - 11 = low risk (green). Last updated June 2023.

Risk	Impact	Cost to Reduce Impact 5 = High Cost		Impact Probability & Scope, Quantity, or Volume 5 = Large Scope / High probability		Potential Impact Severity 5 = High Severity		Level of Legislative Management 5 = No Current Legislative Controls		Impact Controllability 5 = Difficult to Control or Mitigate		Total Score
		Score	Comments	Score	Comments	Score	Comments	Score	Comments	Score	Comments	
Biosecurity Farming activities can facilitate the spread of invasive pests or pathogens. Additionally, there are risks associated with biofouling pests on vessels and structures.	Potential impacts on natural ecosystems include disease, predation, competition, habitat modification, other food web interactions.	4	Investment in readiness and prevention is costly but beneficial in the longer term. Destruction of pests and treatment for disease post-incursion is difficult & more expensive over time.	5	Potential for widespread effects due to volume and frequency of international and national transport pathways.	5	Potentially very large impacts – widespread mortality or displacement of stock possible. Significant potential impacts to natural ecosystems and species.	2	Extensive regulation surrounds biosecurity. E.g. Biosecurity Act 1993, Resource Management Act 1991, Industry biosecurity standards.	3	Pest and disease removal once established is very difficult. However, controls to manage pest and disease impacts are available and are effective when coordinated through a Biosecurity Management process.	19
Hydrological effects Effects of farm structures on currents and waves. Hydrological predictors aid the design of farms.	Water current speeds can be reduced upstream, downstream of farms, and in some cases increased beneath structures. Potential for reduction in tidal, wind and wave driven and residual current speeds over embayment scales.	2	Appropriate farm placement and orientation important	2	Localised small- scale effects from farms. Farm density in NZ has limited cumulative effect (Plew, 2011)	2	Limited and small-scale localised effects. Potential to reduce coastal erosion by reducing surface waves (Plew, 2011)	2	Regulated through RMA and consenting process. Site selection and effects assessed by experts.	1	Well controlled through the RMA process	9
Modification of Benthic Habitat High rate of occurrence – biodeposition to benthos	Accumulation of shell and organic material can occur which can be habitat forming, leading to changes in	2	Highly regulated under RMA and New Zealand Coastal Policy	1	Localised footprint under farm and within 20-50m of farm boundary	2	Often positive effects for already modified benthic and pelagic	1	Highly regulated under RMA and New Zealand	2	Well controlled through the RMA process. Positive	8

Risk	Impact	Cost to Reduce Impact 5 = High Cost		Impact Probability & Scope, Quantity, or Volume 5 = Large Scope / High probability		Potential Impact Severity 5 = High Severity		Level of Legislative Management 5 = No Current Legislative Controls		Impact Controllability 5 = Difficult to Control or Mitigate		Total Score
		Score	Comments	Score	Comments	Score	Comments	Score	Comments	Score	Comments	
directly under farms etc. Sometimes shell products purposely deployed to benthos for restoration projects. Can facilitate detritivore species such as sea cucumbers.	abundance for some species (e.g. increased abundance of seastars and whelks). Potential for positive restorative effects particularly in areas previously modified by sedimentation and contact fishing. Localised increases in fish abundance by providing food, and habitat refuge.		Statement NESMA through the consenting process		depending on current velocities.		ecosystems, which can change the abundance of some species (e.g. localised increases in seastars and whelks)		Coastal Policy Statement NESMA		effects could be better evaluated.	
Effects on Marine Mammals Marine mammal interaction with farms is common and typically harmless or potentially beneficial – e.g., seals resting on floats, farms aggregating prey species. Potential impacts include habitat modification/exclusion, artificial lighting, underwater noise, vessel strike and there is some entanglement risk if farm structures are not well maintained.	Impact severity is very species dependent and any potential for adverse effects is highly managed through the consenting process.	2	Main costs result from consultation at consenting and site selection (not ongoing). Minor costs associated with reduced vessel speeds and requirements to manage incidents or encounters as required. Use of acoustic deterrents not recommended.	2	Marine mammals are highly mobile with wide ranges and may be attracted by fish aggregations facilitated by farm structures. The transitory nature of interactions suggests that population level effects are unlikely. (Clement, Milardi, & Cumming, 2021)	5	Although unlikely, highly threatened marine mammal species may be impacted if entanglement were to occur.	1	Marine Mammals Protection Act 1978 has strict requirements for monitoring and reporting. Regulated under consenting and New Zealand Coastal Policy Statement, particularly in areas known to include ranges for endangered species. NESMA	2	Requires implementation of best management practices to maintain farm structures. Not difficult to implement through SOPs and staff training. Well maintained farm structures & practices have minimal impact.	13
Effects on Seabirds Impacts highly localised and minimal, some entanglement potential if farm structures are not well maintained, provision of roosts away from terrestrial predators may be beneficial, noise disturbance is a potential issue. Site selection important to avoid range restricted	Potential impacts include entanglement, noise disturbance, habitat modification, modification of prey dynamics, provision of roost sites. Any potential for adverse effects is highly managed through the consenting process.	2	Site selection to minimise spatial overlap with critical breeding or feeding grounds – occurs during consenting process (no ongoing costs associated). Minor costs associated with reduced vessel speeds and	1	High probability of seabird interactions with farms due to roosting structure and organic materials produced during harvest. Structures also shown to provide hunting grounds for seabirds. Probability of negative interactions	3	Potential impacts include mortality raising severity, however historical records indicate the likelihood is extremely low and limited to few individuals.	2	Wildlife Act 1953 requirements, Some regulation under consenting and New Zealand Coastal Policy Statement. NESMA	2	Very easy to reduce risk through farm placement and best practice farm management. Likelihood of interaction is high and difficult to reduce, although interactions are overwhelmingly	10






Risk	Impact	Cost to Reduce Impact 5 = High Cost		Impact Probability & Scope, Quantity, or Volume 5 = Large Scope / High probability		Potential Impact Severity 5 = High Severity		Level of Legislative Management 5 = No Current Legislative Controls		Impact Controllability 5 = Difficult to Control or Mitigate		Total Score
		Score	Comments	Score	Comments	Score	Comments	Score	Comments	Score	Comments	
species, important breeding or feeding areas.			requirement to cease operation to manage incidents or encounters as required.		low. Chance of entanglement low, particularly if farm structures are well maintained.						positive. Negative interactions unlikely.	
Contaminant Inputs to Water Contaminants in the water can be highly toxic, high risk, and are strictly controlled for human consumption standards and environmental impacts. Very few originate from farming practice except uncommonly in the form of spills.	Can include heavy metals, detergents, fuels, disinfectants, plastics, capacity to accumulate in sediments and bioaccumulate in tissues of organisms, range of sub lethal to lethal impacts on biota. Few of these originate from farming practices.	3	Some ongoing costs associated with waste management practices, spill kit construction, training, and maintenance activities.	2	Typically, a localised footprint, low concentrations introduced. However, small chance of larger impacts in the case of unlikely spill events.	5	Can be highly toxic and persistent, cumulative impacts over time increase risk.	1	High level of controls through consenting. Legislative controls for Discharge. RMA.	2	Highly controllable for waste and spills, and response procedures / equipment easy to implement and train for.	13
Effects on Fish Aggregation around structures is variable depending on farm type, location, and fish populations present. Farm structures can provide habitat structure for numerous species on and around lines.	Changes in the distribution and productivity of fish populations. Often positive impacts on fish populations and abundance. Potential for negative impacts through changes to fishing pressure, depending on regulations, around farm structures.	2	Some costs associated with initial site selection to avoid critical spawning habitat areas (not ongoing).	2	Localised impacts	1	Impacts primarily positive. Farms provide habitat structure and refuge for fish species.	2	Assessed under RMA through consenting, especially impacts to fisheries and fish habitats through the UAE test.	3	Very little ability to make changes for fish, however impacts are largely positive.	10
Seawater Nutrient Chemistry Mostly localised dependent on flushing and stocking densities, etc. Oceanic and land derived nutrients are greater drivers of nutrient chemistry.	Mussels release dissolved nutrients, mostly ammonia which can accelerate localised primary production of micro- and macro- algae. However, they also take up nitrogen during feeding so harvest removes nitrogen from the system which can be beneficial, particularly in areas where terrestrial discharge of nitrogen is occurring.	2	Potential for any adverse effects is managed through the consenting process	2	Impacts are mostly localised and diffuse, difficult to detect beyond the farm boundary	2	Low potential for adverse effects	2	Farm sites assessed prior to establishment. Consents informed by RMA, NES-MA, and national guidance.	5	Water nutrient characters are naturally variable and mostly driven by oceanic and land derived sources	13

Risk	Impact	Cost to Reduce Impact 5 = High Cost		Impact Probability & Scope, Quantity, or Volume 5 = Large Scope / High probability		Potential Impact Severity 5 = High Severity		Level of Legislative Management 5 = No Current Legislative Controls		Impact Controllability 5 = Difficult to Control or Mitigate		Total Score
		Score	Comments	Score	Comments	Score	Comments	Score	Comments	Score	Comments	
Alteration of Plankton Community Structure Localised effects well understood. Little evidence to suggest long term/large scale shifts in community composition, plankton abundance. Unlikely that there are significant cumulative effects occurring and definitive studies would be prohibitively expensive.	Plankton community structure may be altered by high quantities of filter feeders. Evidence suggests that farm structures are unlikely to significantly impact planktonic communities in NZ. (Newcombe & Broekhuizen, 2020)	2	Only reduced by reducing stocking density (potential associated costs associated with production loss).	2	High volumes of water are filtered but effects are largely limited to farm scale. Little evidence of broad-scale effects and definitive studies prohibitively expensive. (Newcombe & Broekhuizen, 2020)	2	Little evidence to suggest broad scale negative impacts on plankton communities, can increase water clarity	3	Under the RMA and consents, this can be assessed on a case-by-case basis. Cumulative effects assessment is also required under RMA which is supported by ecosystem models	2	Primary feeding mechanism, not controllable. Density of mussel farms controlled through consenting process.	11
Beach / Coastal Sediment Disruption Spat collectors drive onto Te-Oneroa-a-Tohe to gather spat during a defined spat collecting season.	Localised effects of collecting spat via loaders on beach infauna has been assessed as minor. This is a high energy environment which recovers rapidly.	2	Minor costs associated with agreed intensity of loader activity.	2	Highly localised – single location nationwide with strict restrictions on activity intensity and duration of operations	2	Impacts on infauna shown to be minimal.	3	Regulated under also Te Oneroa-a-Tōhe Board and Beach Management Plan and industry voluntary Code of Practice	4	Hand collection not feasible for commercial operation. Alternatives currently limited.	13
Altered natural recruitment – Rope caught spat The removal of spat from natural cycles for the purpose of farming may alter planktonic community structure by removing plankton source, with potential effects on natural recruitment.	Could potentially limit natural recruitment of wild stocks, or affect a planktonic food source. No evidence that natural recruitment is being affected by the current scale of spat collection via ropes.	4	Alternatives have associated R&D and implementation costs – some are quite expensive (E.g. hatcheries, flupsies)	2	Spat catching on ropes accounts for approximately 20 percent of the industry spat supply and occurs periodically across several regions. Further alleviated via hatcheries and improved nursery technology.	1	Short duration and small scale of spat catching on ropes across multiple regions is unlikely to have wider impacts on natural recruitment.	2	Locations for and potential effects of spat catching are assessed under RMA consenting process. All spat collection sites must be consented as farm sites are. Most structures are temporary.	3	Hatchery and nursery development underway but costly and likely to be a longer term solution.	12
Genetic Interactions of Selectively Bred Stock with Wild Populations Dispersal of gametes and	Inter-region seed-stock transfer promotes genetic connectivity between populations, wild sourcing means that larval	3	Use of triploidy for spat from breeding programmes will add cost but would	3	Gamete production is very high – unable to prevent spawning or harvest before	3	Selectively bred stocks may have effects on wild population	4	No current legislation of selective breeding – gene alteration	3	Larval dispersal is not controllable, Harvest before maturity is not viable. Sourcing	16











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larvae from breeding programmes may alter wild populations and can be widely dispersed, may also homogenise gene pool between wild sources.	production within farms is not of concern, mussels that have undergone selective breeding may alter genetic structure of wild populations.		be effective. Wild sourced spat is cheaper and does not pose an issue if caught locally.		spawning. However, triploidy would mitigate this risk. Nationwide and interconnected industry with between region movements of stock.		genetics, although extent of effects currently not quantified.		currently not allowed.		genetics from local populations are increasingly used to manage risk. Triploidy for could mitigate any risk of genetic transfers and can be used once hatchery production increases.	
Shading Shading from farm structures can reduce light levels at the benthos.	Potential for reduced primary production, - micro and macro algae, sea grass.	2	Costs are at consenting stage to assess risks and avoid adverse effects to the benthos (not ongoing).	1	Highly localised effects – directly under farm only	1	Minimal impact on photosynthetic production below structures. Reduction of light minimal. Farms not placed above areas of significant primary production.	3	Regulated under consents during site selection.	1	No control necessary.	8

9 Certification Alignment





The tables below indicate how the SMF and A+ environmental programme align with known international environmental standards for Aquaculture. A benchmarking exercise was completed to assess the level to which the SMF meets the criteria listed under each standard. Each criterion is listed as being met to a high, medium, or low level of coverage under the SMF with descriptions of the related SMF sections and requirements. Last reviewed July 2023.

Aquaculture Stewardship Council (ASC) – Bivalve Standard Certification				
ASC Reference	Requirements for ASC – Bivalve Standard Certification	Section Reference - AQNZ SMF for Greenshell mussel industry		Level of Coverage of ASC requirements by AQNZ SMF (High, Medium, Low)
Overview of the ASC System	A certified chain of custody ensures traceability of products from production to point of sale through the Marine Stewardship Council chain of custody process. The MSC CoC process is currently under review.	Food Safety: Traceability Ecology: Biosecurity	 	Medium Farms are required to comply with the BMS-RCS monitoring and regulations. Traceability is also required under the industry biosecurity standards and in required biosecurity management plans. The AQNZ SMF does not include procedures for processing, packaging, or distribution.
Principle 1 - Legal Obligations	Compliance with all applicable legal requirements and regulations where farming operation is located	Compliance		High Compliance with all legislation and resource consents is required.
Principle 2 – 2.1 Benthic Effects	Benthic effects for off-bottom and suspended culture methods are monitored to avoid remedy or mitigate significant adverse effects on habitats.	Ecology: Biodiversity and Benthic Effects		Medium Best practice methods are required to reduce discharge to the benthos. Resource consents specify monitoring for benthic impacts. Benthic analyses or consideration is completed through the consenting process. Sulfide level analysis OR benthic community structure monitoring is not required.
Principle 2 – 2.2 Pelagic Effects	The ecological carrying capacity of the applicable water body must not be exceeded	Compliance		High Carrying capacity for water bodies is considered at the consent application stage and is governed by local





Aquaculture Stewardship Council (ASC) – Bivalve Standard Certification

ASC Reference	Requirements for ASC – Bivalve Standard Certification	Section Reference - AQNZ SMF for Greenshell mussel industry		Level of Coverage of ASC requirements by AQNZ SMF (High, Medium, Low)
				government. Farmers are expected to fully comply with resource consents.
Principle 2 – 2.3 Critical Habitat and Species Interactions	Farming operations are not permitted to adversely affect endangered species or habitats that they depend on	Ecology: Biodiversity, Benthic Effects, and Wildlife Compliance	 	<p>High</p> <p>Farmers are expected have a Wildlife Management Plan detailing species or communities of high ecological value potentially affected by the farm, reporting procedures for incidents or sightings, and best practice procedures from the Department of Conservation. Wildlife incidents are recorded and reported, and staff training of best management practices is required.</p> <p>Sensitive habitats and species are thoroughly considered in the consenting process and full compliance is required.</p>
Principle 2 – 2.4 Environmental Awareness	Farmers are required to provide training and education regarding compliance with set environmental codes of practices and management plans	Ecology, Water Quality, Waste, Resources, Food Safety, Community	     	<p>High</p> <p>Staff training of best management practices is required across multiple areas of the SMF wherever staff awareness of management plans or standard operating procedure is appropriate or required. Farmers are expected to maintain robust training records.</p>
Principle 3 – 3.1 Introduced Pests and Pathogens Principle 4 – 4.1 Disease and pest management practices	Compliance with best management practices for preventing and managing disease and pest introductions Pesticide and chemical use is restricted	Ecology: Biosecurity Compliance	 	<p>High</p> <p>Best practice biosecurity methods are required regarding the movement of equipment or stock and for the surveillance and / or containment of pests and disease as per the industry biosecurity standards and resource consent conditions.</p>








Aquaculture Stewardship Council (ASC) – Bivalve Standard Certification

ASC Reference	Requirements for ASC – Bivalve Standard Certification	Section Reference - AQNZ SMF for Greenshell mussel industry		Level of Coverage of ASC requirements by AQNZ SMF (High, Medium, Low)
Principle 3 – 3.2 Sustainable Wild Seed Procurement	Wild seed may not be harvested from an open-access unregulated source	Ecology: Te-Oneroa-a-Tōhē Spat		Medium Most spat is sourced from a regulated fishery (GLM 9) and full compliance with fishery regulations is required. Farmers also expected to source spat from collectors operating under the codes of practice.
Principle 3 – 3.3 Introduced Non-native Cultivated Species	Responsible introduction of non-native cultivated species			Not Applicable Greenshell mussels are native to New Zealand
Principle 3 – 3.4 Native Species Cultivation	Efforts must be made to address genetic concerns specific to species and geographic region for hatchery produced seed.	Ecology: Te-Oneroa-a-Tōhē Spat		Low Most Greenshell mussel seeds are produced locally or sourced from wild seed. Hatchery operations for GSM are relatively new in NZ.
Principle 3 – 3.5 Transgenic Animals	The farming of transgenic animals is not permitted			Not Applicable Transgenic animals are not farmed in New Zealand
Principle 5 – 5.1 Waste Management and Pollution Control	Farmers are required to have spill prevention and response plans in place	Water Quality: Pollution		High Best management practices are required in relation to storage and use of chemicals and fuels. Training is required to ensure compliance with oil spill contingency plans.
Principle 5 – 5.1 Waste Management and Pollution Control	Shellfish growers should appropriately store and dispose of waste and reuse and recycle where suitable	Waste Management: Marine Debris, Zero Waste & Recycling		High Farms are required to develop a waste management plan detailing appropriate storage and disposal of organic and non-organic waste. Waste types and amounts is to be reported.







Aquaculture Stewardship Council (ASC) – Bivalve Standard Certification

ASC Reference	Requirements for ASC – Bivalve Standard Certification	Section Reference - AQNZ SMF for Greenshell mussel industry		Level of Coverage of ASC requirements by AQNZ SMF (High, Medium, Low)
				<p>Best practices are required to retrieve and dispose of waste material</p> <p>Farms are required to consider opportunities for recycling and waste reduction</p>
Principle 5 – 5.2 Energy Efficiency	On-farm energy consumption should be monitored, and growers should aim to improve efficiency	Resources: Energy		<p>High</p> <p>Farms are required to monitor fuel usage and to minimise the use of non-renewable energy resources. Farmers are expected to actively pursue or investigate available clean energy options.</p>
Principle 6 – 6.1 Community Relations and Interaction	Farmers are to interact with communities in a positive manner and responsibly maintain farm sites to minimise conflicts	<p>Community: Communication, Navigation, visual impacts, Noise and Odour</p> <p>Waste: Marine Debris</p>	 	<p>High</p> <p>Farmers are required to have a system in place for managing and responding to complaints, operate farms in a socially sustainable way with consideration of local communities, and report contributions to local communities.</p>
Principle 7 – Social and Cultural Responsibility	Child labour, forced labour, and discrimination is not permitted	Employee Welfare		<p>High</p> <p>Farmers are required to comply with all NZ Health and Safety and Employment legislation. Farmers are also required to have regard to the ILO convention on labour rights.</p>





Global Seafood Alliance - Best Aquaculture Practices (GSA BAP) Certification (Mussel Farm Standards)

GSA BAP Reference	Requirements for GSA BAP (Mussel Farm Standards)	Section Reference - AQNZ SMF for Greenshell mussel industry	Level of Coverage of GSA BAP requirements by AQNZ SMF (High, Medium, Low)
1. Community – Property Rights and Regulatory Compliance	Compliance with all local and national laws and environmental and social regulations.	Compliance	 High Compliance with all legislation and resource consents is required.
2. Community – Community Relations	Farm management should accommodate traditional uses of natural resources	Iwi Participation	 Medium Farm operations are required to consider sites of significance to Iwi and traditional harvesting practices of mahinga kai during the resource consent process.
2. Community – Community Relations	Good community relations	Community: Communication	 High Good communication with communities is required. Expected to have systems for managing and responding to complaints effectively. Report on community engagements.
2. Community – Community Relations	Farms should maintain a neat and attractive appearance	Community: Visual Impacts	 High Farms are required to maintain the aesthetic values of the local area to the best of their abilities.
3. Community – Worker Safety and Employee Relations	Farms shall comply with local and national labour laws	Compliance Community: Employee Welfare	 High  Farms are required to comply with relevant health and safety and employment legislation
4. Environment – Carrying Capacity	Farms shall be operated in a way that considers the carrying capacity of the water body and potential disruption of the ecosystem’s natural function	Compliance	 Medium Stocking density, farm size, and farm density impacts on carrying capacity are assessed during consenting process and full compliance with consent conditions is required.





Global Seafood Alliance - Best Aquaculture Practices (GSA BAP) Certification (Mussel Farm Standards)

GSA BAP Reference	Requirements for GSA BAP (Mussel Farm Standards)	Section Reference - AQNZ SMF for Greenshell mussel industry		Level of Coverage of GSA BAP requirements by AQNZ SMF (High, Medium, Low)
5. Environment – Seed Supply	The translocation of seed mussels shall avoid the importation or spread of alien invasive or pest species.	Ecology: Biosecurity		High Best practice biosecurity methods are required regarding the movement of equipment or stock as per industry biosecurity standards and consent conditions
5. Environment – Seed Supply	Collection of wild seed or purchase of seed from wild stocks shall be carried out in a sustainable and environmentally sensitive way.	Ecology: Te-Oneroa-a-Tōhē Spat Compliance	 	High Most spat is sourced from a regulated fishery (GLM 9) and full compliance with fishery regulations is required. Farmers also expected to source spat from collectors operating under the codes of practice. In water spat catching sites are regulated under resource consents and full compliance is required.
6. Environment – Sediment Quality	Cultivation areas for rope-grown mussels shall be located and operated in a way that minimises negative impacts on sediment quality and benthic communities including a robust sampling programme	Ecology: Biodiversity, Benthic Effects Compliance	 	Medium Best practice methods are required to reduce discharge to the benthos and accumulation of unwanted organisms on farms that may be lost to the benthos. Resource consents may specify monitoring for benthic impacts, particularly at sites near significant habitats.
7. Environment - Predator and Wildlife Interactions	Farms shall manage physical interactions with wildlife and not reduce the biodiversity of ecosystems through a written Wildlife Interaction Plan	Ecology: Biodiversity, Wildlife		High Farmers are expected have a Wildlife Management Plan detailing species or communities of high ecological value potentially affected by the farm, reporting procedures for incidents or sightings, and best practice procedures from the Department of Conservation. Wildlife incidents are recorded and reported, and staff training of best management practices is required.


Global Seafood Alliance - Best Aquaculture Practices (GSA BAP) Certification (Mussel Farm Standards)

GSA BAP Reference	Requirements for GSA BAP (Mussel Farm Standards)	Section Reference - AQNZ SMF for Greenshell mussel industry		Level of Coverage of GSA BAP requirements by AQNZ SMF (High, Medium, Low)
				Sensitive habitats and species are thoroughly considered in the consenting process and full compliance is required.
8. Environment – Storage and Disposal of Farm Supplies	Fuel, lubricants, and chemicals shall be stored and disposed of in a safe and responsible manner.	Water Quality: Pollution Compliance		<p>High</p> <p>Best management practices are required in relation to storage and use of chemicals and fuels. Training is required to ensure compliance with oil spill contingency plans.</p> <p>Full compliance with NZ legislation for chemical handling and staff safety is required.</p>
8. Environment – Storage and Disposal of Farm Supplies	Accumulated waste and discarded equipment shall be removed and disposed of responsibly	Waste: Waste Management, Marine Debris, Zero Waste & Recycling		<p>High</p> <p>Farms are required to develop a plan detailing appropriate storage and disposal of organic and non-organic waste</p> <p>Best practices are required to retrieve and dispose of waste material</p>
8. Environment – Storage and Disposal of Farm Supplies	Paper and plastic refuse shall be disposed of in a sanitary and responsible way.	Waste: Zero Waste & Recycling, Waste Management		<p>High</p> <p>Farms are required to consider opportunities for recycling and waste reduction</p>
9. Animal Health and Welfare – Biosecurity and Disease Management	Farms shall minimise the spread of infectious diseases and parasites including monitoring for possible disease outbreaks and management of stock transportation.	Ecology: Biosecurity Compliance		<p>High</p> <p>Best practice biosecurity methods are required regarding the movement of equipment or stock and for the surveillance and / or containment of pests and disease as per the industry biosecurity standards and resource consent conditions.</p>









Global Seafood Alliance - Best Aquaculture Practices (GSA BAP) Certification (Mussel Farm Standards)

GSA BAP Reference	Requirements for GSA BAP (Mussel Farm Standards)	Section Reference - AQNZ SMF for Greenshell mussel industry	Level of Coverage of GSA BAP requirements by AQNZ SMF (High, Medium, Low)
10. Food Safety – Control of Potential Food Safety Hazards	Farming practices shall prevent the introduction of potential consumer health hazards that could be encountered during consumption.	Food Safety: Animal Health and Hygiene Ecology: Biosecurity	  High Farms are required to comply with the Regulated Control Scheme for Bivalve Molluscan shellfish (BMS RCS). Farmers must also operate under a biosecurity management plan in accordance with industry biosecurity standards for reducing disease risk.
11. Traceability – Record Keeping Requirement	Required data shall be recorded for each culture unit and each production cycle including: farm name and licence, harvester, location, species, harvest date and time, harvest method and quantity, seed source	Food Safety: Traceability Ecology: Biosecurity	  High Traceability is required under the industry biosecurity standards and in required biosecurity management plans.







Global Good Agricultural Practice (Global G.A.P) - Aquaculture Standard

Global G.A.P Reference	Requirements for Global G.A.P certification	Sections Reference - AQNZ SMF for Greenshell mussel industry	Level of Coverage of Global G.A.P requirements by AQNZ SMF (High, Medium, Low)
AB1.0 Site Management (Legal Compliance)	Farm shall comply with all legal and regulatory requirements	Compliance	 High 100% compliance with all resource consents and other applicable legislation is required by the SMF
AB2.0 Reproduction - Seed Supply	Demonstrate where brood stock originates from, managing hatcheries		Not Covered Most spat is sourced responsibly via a strictly managed fishery with hatcheries currently producing low volumes to industry. Currently not required for mussels under this SMF.



Global Good Agricultural Practice (Global G.A.P) - Aquaculture Standard

Global G.A.P Reference	Requirements for Global G.A.P certification	Sections Reference - AQNZ SMF for Greenshell mussel industry	Level of Coverage of Global G.A.P requirements by AQNZ SMF (High, Medium, Low)
AB3.1 Chemical Storage	Chemical storage is managed appropriately including reference to MSDS sheets, training, and emergency measures.	Water Quality: Discharges, Pollution Waste: Waste Management Compliance	   High 100% compliance with relevant legislation including the Hazardous Substance and New Organisms Act 1996. Regulation of chemicals required for prevention of spills. Emergency spill response plans and training required.
AB4.1 Occupational H & S - Training	Health & safety with regards to basic human needs and hygiene. Chemical handling training is provided and diving safety health and safety practices are in accordance with legislation.	Community: Employee Welfare Compliance	  High Compliance with New Zealand's comprehensive Health and Safety regulations is required along with a target of zero incidences of injury or harm in the workplace. Appropriate staff training for all tasks required.
AB5.1 Fish Welfare, Management & Husbandry - Traceability	Traceability of stock origin and understanding of hygiene practices.	Food Safety: Animal Health, Traceability Compliance	  Medium Farms are required to comply with the BMS-RCS monitoring and regulations. Traceability is also required under the industry biosecurity standards and in required biosecurity management plans.
AB5.2 - 5.5 Fish Welfare, Management & Husbandry - Fish Health & Welfare - Treatments - Treatment Records - Vaccinations - Mortality	Water quality monitoring, infrastructure maintenance, types of medicines used, testing of flesh, mortality inspection, machinery & equipment kept in good condition. Sampling programme incorporated into Animal Health Plan, at accredited lab.	Food Safety: Animal Health Ecology: Biosecurity	 High Compliance with BMS-RCS is required. No therapeutants, GMOs, or growth hormones are used by the Greenshell mussel industry in NZ. Records of mortalities are required. Sampling is coordinated by Biosecurity NZ and covered in the industry biosecurity standards.









Global Good Agricultural Practice (Global G.A.P) - Aquaculture Standard

Global G.A.P Reference	Requirements for Global G.A.P certification	Sections Reference - AQNZ SMF for Greenshell mussel industry	Level of Coverage of Global G.A.P requirements by AQNZ SMF (High, Medium, Low)
AB6.0 Harvesting	Hygiene of transport and handling and correct temperature parameters ensured.	Food Safety: Animal Health	 High Compliance with BMS-RCS is required.
AB7.0 Sampling & Testing	Sampling programme incorporated into Animal Health Plan, at accredited lab.	Food Safety: Animal Health	 High Compliance with BMS-RCS is required.
AB8.0 Feed Management	Source appropriate type of food, feed documentation, appropriate storage of feed.		Not applicable Mussels do not require feeding
AB9.0 Pest Control (pest control on site)	Is there a pest control plan in place	Ecology: Wildlife	 Low Pest control as referred to by the Global G.A.P is not a material issue for the Greenshell mussel industry in NZ. Wildlife is managed through wildlife management plans, training, and reporting requirements.
AB10.0 Environmental & Biodiversity Management	Waste management plan and appropriate collection and disposal of waste	Waste: Waste Management	 High A plan is required which details the appropriate storage and disposal of all waste.
AB10.1 Environmental Management	Biodiversity impact assessment undertaken and incorporated in site design and selection.	Ecology: Biodiversity, Benthic Effects Compliance	  High When applying for resource consent an applicant is required to provide a variety of information including an ecological investigation of the proposed marine farm area and the biological features and fisheries resources of the adjacent coast.





Global Good Agricultural Practice (Global G.A.P) - Aquaculture Standard

Global G.A.P Reference	Requirements for Global G.A.P certification	Sections Reference - AQNZ SMF for Greenshell mussel industry	Level of Coverage of Global G.A.P requirements by AQNZ SMF (High, Medium, Low)
AB10.1 Environmental Management	A biodiversity management plan completed and monitoring of impact of farm on benthic fauna and sediments undertaken annually	Ecology: Biodiversity and Benthic Effects Compliance	 Medium Best practice methods are required to reduce discharge to the benthos. Resource consents may specify monitoring for benthic impacts. Full compliance with consent conditions is required.
AB10.2 Predator Control	Predator control mechanisms	Appendix 2: Operational Procedures	Not Covered Operational procedures refer to pest control but do not directly address the threat of mussels being predated on by fish and pea crabs (which are thought to reduce mussel growth).
AB 10.3 Escapes	Take all practicable steps to reduce likelihood of escapes.	N/A	Not Applicable Mussels are in an open system and are sedentary. No practicable way to prevent escapes exists as escapes are unlikely.
AB10.4 High Conservation Value areas	Management practices reflect sites located in a high conservation value area e.g., improvement or restoration of farm sites in the inter-tidal zone or high conservation value areas.	Ecology: Biodiversity, Benthic Effects Compliance	 High Farmers are required to have an awareness of habitats, species, or communities of high ecological value affected by the farm. These are detailed in resource consents and are considered during the consenting process. Additional monitoring or management practices may be required in the resource consent and 100% compliance is required.

Global Good Agricultural Practice (Global G.A.P) - Aquaculture Standard



Global G.A.P Reference	Requirements for Global G.A.P certification	Sections Reference - AQNZ SMF for Greenshell mussel industry	Level of Coverage of Global G.A.P requirements by AQNZ SMF (High, Medium, Low)
AB11.1 Water Usage & Disposal - General	Suspended solids in recipient waters covered in EIA/EMP or farm structures.	Ecology: Benthic Effects Water Quality: Discharges Compliance	   Medium Best management practice methods are required to be followed to minimise organic waste in recipient waters, and discharges are assessed during consenting process AEE. 100% compliance is required with discharge consents.
AB11.1 Water Usage & Disposal - General	Compliance with water quality discharge and monitoring requirements of local regulations.	Water Quality: Discharges Compliance	  High 100% compliance with consents for discharges is required
AB11.1 Water Usage & Disposal - General	Use of fresh water to reduce salt content of farm water. Abstraction and water use meet legal requirements.	N/A	Not covered This is not applicable to NZ aquaculture
AB11.2 Water Usage & Disposal - Effluent	Organic waste is appropriately stored	Waste: Waste Management	 High A plan is required which details the appropriate storage and disposal of all waste. Amounts of waste are reported.
AB11.2 Water Usage & Disposal - Effluent	Compliance with water quality discharge and monitoring requirements of local regulations.	Water Quality: Discharges	  High 100% compliance with consents for discharges is required






Global Good Agricultural Practice (Global G.A.P) - Aquaculture Standard




Global G.A.P Reference	Requirements for Global G.A.P certification	Sections Reference - AQNZ SMF for Greenshell mussel industry	Level of Coverage of Global G.A.P requirements by AQNZ SMF (High, Medium, Low)
AB12.1 Post Harvest - Document Control System	Traceability to show how certified and non-certified products can't get mixed.	Food Safety: Traceability Compliance	 <p>Medium</p> <p>Farms are required to comply with the BMS-RCS monitoring and regulations. Traceability is also required under the industry biosecurity standards and in required biosecurity management plans.</p> <p>No specific requirements for mixing certified and non-certified as A+ attributed to operator not stock.</p>
AB12.1 Post Harvest - Document Control System	Food based safety system in place	Food Safety: Animal Health and Traceability	 <p>High</p> <p>Farms are required to comply with the BMS-RCS monitoring and regulations.</p>
AB14.1 Social Criteria	Global GAP use GRASP system (social management system) to manage workers health, safety & welfare.	Community: Communication, Employee Welfare	 <p>High</p> <p>Employee welfare is compliant with NZ employment legislation.</p>
Chain of Custody - 2 Complaints	Is there a complaints system in place for recording, review and follow up	Community: Communication, Employee Welfare	 <p>High</p> <p>Records of complaints and proactive community participation is required.</p>



Global Sustainable Seafood Initiative (GSSI)


GSSI Reference	Requirements for GSSI Certification	Section Reference - AQNZ SMF for Greenshell mussel industry	Level of Coverage of GSSI requirements by AQNZ SMF (High, Medium, Low)
GSSI Requirements for Aquaculture Certification Standards			

Global Sustainable Seafood Initiative (GSSI)				
GSSI Reference	Requirements for GSSI Certification	Section Reference - AQNZ SMF for Greenshell mussel industry		Level of Coverage of GSSI requirements by AQNZ SMF (High, Medium, Low)
C.1 Aquatic Animal Health Management	Includes transportation of stock. Requires suitably trained staff.	Food Safety: Animal Health & Hygiene, Traceability Ecology: Biosecurity		High Farms are required to comply with the BMS-RCS monitoring and regulations. Traceability is also required under the industry biosecurity standards and in required biosecurity management plans. Staff training records are required for animal health, husbandry, transport, harvest, etc.
C.1 Aquatic Animal Health Management	Prudent use of veterinary drugs	N/A		Not Applicable No therapeutants, drugs, GMOs or Growth Hormones used in NZ mussel farming.
C.2 Chemical & Veterinary Drug Use	Appropriate documentation for drug use, consideration for impact on the environment	N/A		Not Applicable No therapeutants, drugs, GMOs or Growth Hormones used in NZ mussel farming.
C.3 Feed & Fertilizer Use	Ensure environmental impacts of feed & fertilizer use are minimised, recorded and wider issues noted.	N/A		Not Applicable Mussels do not require feeding
C.4 Impacts on Habitat & Biodiversity	Consideration for impact on local habitats & biodiversity	Ecology: Biodiversity, Wildlife, Benthic effects, Biosecurity Compliance Water Quality: Discharges, Pollution		High Farmers are required to have awareness of habitats, species or communities of high ecological, scientific or fisheries value affected by the farm. An initial ecological investigation is required by consents to identify an appropriate site for farms.






Global Sustainable Seafood Initiative (GSSI)			
GSSI Reference	Requirements for GSSI Certification	Section Reference - AQNZ SMF for Greenshell mussel industry	Level of Coverage of GSSI requirements by AQNZ SMF (High, Medium, Low)
			<p>100% compliance with consent conditions is required.</p> <p>Wildlife management plans are required. Wildlife incidents are recorded and staff training on management practices to reduce wildlife impact is required.</p> <p>Discharges and waste in the marine environment are highly regulated to minimise risk.</p>
C.4 Impacts on Habitat & Biodiversity	Protection of high conservation areas	Ecology: Biodiversity, Wildlife, Benthic effects, Biosecurity Compliance	  <p>High</p> <p>Mussel farms are not located on high conservation value sites as this is assessed at consenting. 100% compliance with consents is required, including farm boundaries, monitoring of effects, and special requirements around sensitive habitats.</p>
C.4 Impacts on Habitat & Biodiversity	Impacts of waste on the seabed	Ecology: Biodiversity, Benthic effects	 <p>High</p> <p>Best practice methods are required to reduce materials being discharged to the benthic environment.</p>
C.4 Impacts on Habitat & Biodiversity	Restoration programmes	Ecology: Biodiversity	 <p>Medium</p> <p>Farmers are required to contribute to or support restoration initiatives wherever possible, including pest management in local areas.</p>
C.5 Seed	Source seed legally & wild seed responsibly obtained	Ecology: Te-Oneroa-a-Tōhē Spat Compliance	 <p>High</p>

Global Sustainable Seafood Initiative (GSSI)				
GSSI Reference	Requirements for GSSI Certification	Section Reference - AQNZ SMF for Greenshell mussel industry		Level of Coverage of GSSI requirements by AQNZ SMF (High, Medium, Low)
				<p>Farms are required to follow best management practices for resource use including spat capture compliant with the GLM 9 fishery Management Plan and codes of practice.</p> <p>Nursery sites and in-water spat catching sites must be consented and full compliance with consent conditions required.</p>
C.5 Seed	Promote use of hatchery reared seed	Not Covered		<p>Not Covered</p> <p>Hatchery production is not covered by the SMF</p>
C.6 Species Selection & Escapes	Reduction of escapees	N/A		<p>Not Applicable</p> <p>Mussels are in an open system and are sedentary. No practicable way to prevent escapes exists as escapes are unlikely.</p>
C.6 Species Selection & Escapes	Legal compliance with species selection	N/A		<p>Not Applicable</p> <p>Introduced species not utilised by NZ mussel industry</p>
C.7 General Site Management	Legal compliance during construction	Compliance		<p>High</p> <p>Compliance with all resource consents would include compliance during construction.</p>
C.7 General Site Management	Appropriate storage for waste to prevent contamination and wasting of resources	Waste: Waste Management, Zero Waste & Recycling		<p>High</p> <p>A waste management plan is required which details the appropriate storage and disposal of all waste.</p>







Global Sustainable Seafood Initiative (GSSI)			
GSSI Reference	Requirements for GSSI Certification	Section Reference - AQNZ SMF for Greenshell mussel industry	Level of Coverage of GSSI requirements by AQNZ SMF (High, Medium, Low)
			Recycling, reduction, and repurposing is encouraged and required wherever possible. Reporting on waste types and amounts required.
C.8 Water Quality & Waste	Legal compliance with water usage	N/A	Not Applicable No legal requirements for water usage beyond payment for water use – water use in mussel farming low (open systems).
C.8 Water Quality & Waste	Water quality & effluents	Water Quality: Discharges Ecology: Benthic Effects	  High 100% compliance with consents for discharges is required. Training of staff in best practice management to reduce discharge is also required. Best practice methods are required to be implemented to reduce materials being discharged to the benthic environment.

Friend of the Sea (FOS) Standard – Aquaculture Shellfish			
FOS Reference	Requirements for FOS Certification	Section Reference - AQNZ SMF for Greenshell mussel industry	Level of Coverage of FOS requirements by AQNZ SMF (High, Medium, Low)
1. Management of Aquaculture System 2. Location of the Site	Compliance with all applicable legal requirements and regulations and management of corrective measures	Compliance	 High Compliance with all legislation and resource consents is required.

Friend of the Sea (FOS) Standard – Aquaculture Shellfish

FOS Reference	Requirements for FOS Certification	Section Reference - AQNZ SMF for Greenshell mussel industry	Level of Coverage of FOS requirements by AQNZ SMF (High, Medium, Low)
1. Management of Aquaculture System – Environmental Emergencies	Environmental emergency drills must be conducted at least annually	Ecology: Biosecurity Resources: Farm Structures & Equipment Water Quality: Pollution	   Medium Farmers are required to implement on-farm biosecurity management procedures including pest and diseases response planning. Staff must be familiar with oil spill contingency plans and contingency plans for structural loss or damage.
1. Management of Aquaculture System – Monitoring Systems	The environmental footprint of the farm must be measured at least every six months	Ecology: Biodiversity, Benthic Effects	 Low Environmental footprint is assessed during the consenting / re-consenting process. Additional monitoring is not required under this SMF as it is dictated by regional councils under consents. Full compliance with resource consents is required.
2. Location of the Site	An environmental footprint assessment shall be conducted to verify that critical ecosystems will not be/have not been altered	Ecology: Biodiversity, Benthic Effects	 High Environmental footprint is assessed during the consenting / re-consenting process. Full compliance with resource consents is required. Critical or sensitive ecosystems are actively avoided during site selection.
3. OGM and Growth Hormones	The use of growth hormones is not permitted	N/A	Not Applicable Growth hormones are not used for Greenshell Mussel production.
4. Disease Prevention and the Use of Drugs	Drugs are not to be used for preventative measures. Drugs may only be allowed by regulations for specific issues.	N/A	Not Applicable Drugs are not used for Greenshell Mussel production.

Friend of the Sea (FOS) Standard – Aquaculture Shellfish

FOS Reference	Requirements for FOS Certification	Section Reference - AQNZ SMF for Greenshell mussel industry	Level of Coverage of FOS requirements by AQNZ SMF (High, Medium, Low)
5. Compliance with Wastewater Parameters	Effluent under the production area must comply with existing regulations (Nutrients, DO, Heavy Metals, Bacteria) and monitored every 6 months	Compliance	 <p>Medium</p> <p>Sediment & Water quality monitoring is not required unless specified by resource consent conditions. Full compliance with resource consents is required.</p>
6. Hazardous Substances	The use of toxic and persistent chemicals (e.g., TBT, DDT) is forbidden	Compliance	 <p>High</p> <p>The use of toxic and persistent chemicals is banned in New Zealand in accordance with the Stockholm Convention. Full compliance with NZ Law is required.</p>
7. Management of Energy	Farmers are required to record energy consumption and undertake to reduce consumption	Resources: Energy	 <p>High</p> <p>Farms are required to monitor fuel usage and to minimise the use of non-renewable energy resources. Farmers are expected to actively pursue or investigate available clean energy options.</p>
8. Social Accountability	Compliance with social accountability including national regulations and ILO on child labour	Community: Employee Welfare	 <p>High</p> <p>Farmers are required to comply with all NZ Health and Safety and Employment legislation. Farmers are also required to have regard to the ILO convention on labour rights.</p>
9. Traceability	Farmers are required to implement a traceability system to verify certified products come from approved systems	Food Safety: Traceability Ecology: Biosecurity	  <p>High</p> <p>Farms are required to comply with the BMS-RCS monitoring and regulations. Traceability is also required under the industry biosecurity standards and in required biosecurity management plans.</p>

10 Appendices

10.1 Appendix 1. A+ Environmental Checklist

The A+ checklist is the method by which farmers annually report their practices and performance in fulfilment of the “assess” component of the SMF. This checklist covers all of the environmental objects, targets, and indicators listed in this SMF and full and accurate completion of the checklist is required from farmers each year. The checklist is reviewed annually and therefore is continuously evolving to reflect best practice and reporting requirements, and improve accessibility for farmers.

Below is an example of the A+ checklist as at July 2023. The checklist is updated annually to reflect feedback from the previous year. An up-to-date example of the current version can be found at <https://www.aplus.org.nz/>.

A+ Environmental Checklist 2022



Aquaculture New Zealand

For the period 1 January 2022 to 31 December 2022

GENERAL

Person(s) completing checklist

Number of hectares farmed

Volume of green weight mussel tonnage harvested (calendar year)

1 COMPLIANCE

- | | | |
|-----|---|--|
| 1.1 | Have there been any changes to your resource consent? | <i>Evidence for verification assessment</i> <ul style="list-style-type: none">• Discuss resource consent and records confirming compliance |
| 1.2 | Have you registered all the farms you operate on the Government Fish Farmer Register (Fishserve)? | <i>Evidence for verification assessment</i> <ul style="list-style-type: none">• Confirm with FishServe records (from 2020) |
| 1.3 | Do you provide copies of the A+ Mussel Farmer On-Water Guide on your vessels for staff to refer to? | <i>Required evidence</i> <ul style="list-style-type: none">• Is the A+ On-Water Guide included in your staff training records?
<i>Evidence for verification assessment</i> <ul style="list-style-type: none">• Confirm guides are on vessels and interview staff to confirm awareness |
| 1.4 | How many council abatement notices have you received for non-compliance at your farms? | <i>Evidence for verification assessment</i> <ul style="list-style-type: none">• View council abatement notice(s) and discuss strategies to mitigate
<i>Global best practice</i> <ul style="list-style-type: none">• Communication with council.• Annual compliance report |
| 1.5 | How many non-compliance notices have you received from Maritime New Zealand? | <i>Evidence for verification assessment</i> <ul style="list-style-type: none">• View non-compliance notice and discuss corrective actions and preventative measures to confirm effectiveness |
| 1.6 | How many non-compliance notices have you received from Worksafe? | <i>Evidence for verification assessment</i> <ul style="list-style-type: none">• View non-compliance notice and discuss corrective actions and preventative measures to confirm effectiveness |
| 1.7 | How many infringement or non-compliance notices have you received from your local harbourmaster? | <i>Evidence for verification assessment</i> <ul style="list-style-type: none">• Check infringement notices and discuss contravening activity and preventative measure undertaken by farm |
| 1.8 | Upload Register for all non-compliances | |

<p>1.9 Are you accredited to any international certification or standard? e.g. Best Aquaculture Practices (BAP), Aquaculture Stewardship Council (ASC), International Organisation for Standards (ISO), organics</p>	<p><i>Required evidence</i></p> <ul style="list-style-type: none"> • Upload certificate, view and check expiry date
<p>1.10 Are you certified to any other environmental programmes? e.g. MFA Environment Programme</p>	<p><i>Required evidence</i></p> <ul style="list-style-type: none"> • Upload certificate, view and check expiry date
<p>1.11 Do you ensure that all contractors operating on your farms adhere to the standards set by your certifications?</p>	<p><i>Required evidence</i></p> <ul style="list-style-type: none"> • Contractor agreements, SOPs, or policies that specify contractor operational expectations
<p>1.12 Do you source any mussel spat from Te Oneroa-a-Tohe (90 Mile Beach)?</p> <p><i>If yes, can you confirm that this mussel spat is from collectors who adhere to the Te Oneroa-a-Tohe Mussel Spat Collecting and Loader Driving Code of Practice?</i></p>	<p><i>Required evidence</i></p> <ul style="list-style-type: none"> • If you are unsure about this question please talk to your spat collector or AQNZ

2 ECOLOGY

Benthic Effects

<p>2.1 Has a benthic survey been undertaken by a suitably qualified science provider (as required for consenting) for any of your farms?</p>	<p><i>Evidence for verification assessment</i></p> <ul style="list-style-type: none"> • Confirm Benthic survey report(s) and discuss results and preventative measures, and any actions taken to mitigate where necessary
<p>2.2 Do you perform any additional visual monitoring of changes to the benthos under your farms beyond minimum consent requirements?</p>	<p><i>Required evidence</i></p> <ul style="list-style-type: none"> • Provide SOP for visual monitoring of benthos <p><i>Evidence for verification assessment</i></p> <ul style="list-style-type: none"> • Confirm monitoring procedure and data • View staff training records and interview staff to confirm awareness and effectiveness of monitoring
<p>2.3 Have best practice methods been implemented to minimise organic matter being discharged to the benthic environment? e.g. mussel drop off, crushed blue mussels, over settled species, biofouling.</p>	<p><i>Required evidence</i></p> <ul style="list-style-type: none"> • Provide SOP's that include provisions to minimise organic discharge or Biofouling Management Plan <p><i>Evidence for verification assessment</i></p> <ul style="list-style-type: none"> • View records of farm stocking density (mussels/m³). • Confirm SOP / Biofouling MP and practices. • View staff training records and interview staff to confirm SOP and awareness. • View any maintenance and inspection records for farm structures. <p><i>Global best practice</i></p> <ul style="list-style-type: none"> • Non-target species reduction plan e.g. harvesting Undaria, Benthic Management Plan

2.4 Please upload any additional related SOP's, benthic survey's, or annual benthic reports that you may have relating to this section

2.5 If any of these documents are publicly available, please insert the link(s) here

Aquatic Biodiversity

2.6 Do you have sensitive aquatic habitats (including reefs, biogenic habitats) in or near the footprint of your farms?

Required evidence

- Upload any Environmental Management Plans (EMP) including maps indicating the location of any sensitive habitats, within the farm boundary

Evidence for verification assessment

- Confirm EMP, management actions and interview staff to confirm awareness and preventative measures are effective

Global best practice

- Internal environmental management systems which assist in protecting sensitive habitats but not required by law
-

Do you monitor these habitats?

Evidence for verification assessment

- View monitoring plan and report
-

2.7 Please upload any additional Biodiversity reports or supporting documentation relating to this section here

Biosecurity

2.8 Are any of your farms covered by a Biosecurity Management Plan that fulfills the requirements of the A+ Biosecurity Standards?

Required evidence

- Upload Biosecurity Management Plan

Evidence for verification assessment

- Confirm Biosecurity Management Plan is in accordance with A+ Biosecurity Standards.
 - Interview staff to confirm awareness and view staff training records.
 - Discuss best management practices if no Biosecurity MP is in place
-

Have farm staff been trained to understand and implement your biosecurity management plan?

Required evidence

- Provide staff training records

Evidence for verification assessment

- Confirm staff training records and interview staff to confirm awareness

Global best practice

- In-house training tools such as PowerPoint presentation and questionnaire
-

2.9 Upload any additional Biosecurity planning evidence or staff training records here.

2.10 For each transfer of stock, are you aware of the health status of both operational zones/regions, for example Management Areas or Controlled Area Notice (CAN)?

2.11 Do you wash, declump and visually inspect stock (spat/seed/mussels) prior to transferring between operational zones and/or require that it has been washed/inspected when receiving it?

Required evidence

- Provide SOP for transferring and receiving stock - including hygiene practices (visual inspection and washing prior to transfer)

Evidence for verification assessment

- Confirm SOP and practices.
- Discuss and interview staff to confirm awareness

Global best practice

- Standard operation procedures
-

2.12 Do you keep records of receipt and transfer of stock for all of your farms?

Required evidence

- Provide records of stock source and transfer. Records to include date/kg/location.

Evidence for verification assessment

- Confirm stock records including source and transfer

Global best practice

- Standard operating procedures
-

2.13 Do you transfer equipment, vessels, and vehicles between operational zones / regions?

Required evidence

- Provide records of equipment movements between operational zones / regions
-

Do you decontaminate equipment, vessels, and vehicles before transferring between operational zones / regions?

Required evidence

- Upload SOP for equipment, vessel, and vehicle transfer, including cleaning and sanitation records, and staff training records

Evidence for verification assessment

- Confirm SOP, practices and training records
 - Discuss and interview staff to confirm awareness
-

2.14 Do you carry a copy of the MPI 'New Zealand's Marine Pest Identification Guide' on your vessels?

Evidence for verification assessment

- Confirm MPI guide on vessel and interview staff to confirm awareness

Global best practice

- In-house training tools such as PowerPoint presentation and questionnaire
-

2.15 Have you reported any notifiable pests or diseases or unusual mortality on your farms?

Required evidence

- Provide records of notifiable pest or disease reports, including any mortality records

Evidence for verification assessment

- Confirm reporting process to MPI, view report and interview staff to confirm awareness

Global best practice

- Shellfish / Fish Health Surveillance Program
 - Survival Improvement Plan
-

2.16 Upload any additional biosecurity SOP's, management plans, or training records here.

Wildlife

2.17 Are any of your farms/hatcheries covered by a Wildlife Interaction Management Plan?

Required evidence

- Upload Wildlife Interaction Management Plan and training records

Evidence for verification assessment

- Confirm Wildlife Management Plan is fit for purpose
 - View training records and interview staff to confirm awareness
-

2.18 Have you provided awareness training to farm staff with regards to reducing the impact on wildlife including marine mammals and birds?

Required evidence

- Provide staff training records

Evidence for verification assessment

- Confirm staff training records, and interview staff to confirm wildlife awareness training tools.

Global best practice

Wildlife Interaction Plan

2.19 Do all marine vessels associated with your farms have a DOC sticker visible to the skipper about how to approach marine mammals?

Required evidence

- If you don't have stickers - [email aplus@aquaculture.org.nz](mailto:aplus@aquaculture.org.nz) and we will send you some

Evidence for verification assessment

- View DoC sticker on vessels, and discuss with skipper and staff to confirm awareness
-

2.20 Did you record or report any injury or mortality incidents for wildlife such as birds or marine mammals?

Required evidence

- Provide wildlife incident and mortality records / register

Evidence for verification assessment

- Confirm wildlife interaction and mortality records including notification to DoC and discuss mitigation methods
-

How many bird mortality incidents did you record?

Evidence for verification assessment

- Review historical records – look for improvement including strategies to reduce bird interactions and mortalities
-

How many marine mammal mortality incidents did you record?

Evidence for verification assessment

- Review historical records – look for improvement including strategies to reduce mammal interactions and mortalities
-

2.21 Upload any additional wildlife incident or interaction documentation here.

2.22 Do your boat transits avoid travelling within 100m from breeding colonies of any threatened or at risk wildlife e.g. King shags or other endangered species?

Required evidence

- Provide map detailing any threatened wildlife breeding colonies

Evidence for verification assessment

- Confirm boat transits are included in Wildlife Interaction Plan.
- View staff training records and interview staff to confirm awareness.

2.23 Upload any additional Wildlife Management Plans, SOP's, training records, or other documentation here

Ecosystem Services

2.24 Have you participated in any programmes or taken any initiatives to restore ecosystems? (e.g. pest management programmes)

Required evidence

- Provide records of participation

Evidence for verification assessment

- Confirm participation of ecosystem restoration program records and discuss the value and outcomes.
- View staff training records and interview staff to confirm awareness

Global best practice

- Ecosystem Services Strategy and training

2.25 Ecology Research - Please outline any new ideas for research or innovation relating to this ecology section that you have to share such as initiatives to protect wildlife, new biosecurity practices or alternative uses for non-target fouling species

Evidence for verification assessment

- Discuss during assessment

3 WATER QUALITY

Discharges

3.1 Has training been provided to staff to reduce vessel and farm discharges e.g. greywater?

Required evidence

- Provide SOP for vessel discharge and staff training records

Evidence for verification assessment

- View consent conditions for compliance of greywater discharge m³
- Confirm SOP is fit for purpose including waste collection procedures
- View staff training records and interview staff to confirm awareness

Global best practice

- Materials Storage Handling and Waste Disposal Plan
-

Pollution

<p>3.2 Do you have a spill response plan and incident register? e.g. for fuel, chemicals or oil</p>	<p><i>Required evidence</i></p> <ul style="list-style-type: none">• Provide Spill/Emergency Response Plan and staff training records <p><i>Evidence for verification assessment</i></p> <ul style="list-style-type: none">• Confirm Plan is fit for purpose• View staff training records and interview to confirm awareness <p><i>Global best practice</i></p> <ul style="list-style-type: none">• Waste collection procedures
<p>3.3 How many pollution or spill incidents have you recorded?</p>	<p><i>Required evidence</i></p> <ul style="list-style-type: none">• Upload records of pollution incidents and preventative measures taken and location map of storage <p><i>Evidence for verification assessment</i></p> <ul style="list-style-type: none">• View Oil/chemical spill kits on site and SOP's e.g. refueling• View chemical and fuel storage on site and any waste collection procedures <p><i>Global best practice</i></p> <ul style="list-style-type: none">• Materials Storage Handling and Waste Disposal plan and any new initiatives to reduce pollution – biodegradable compounds and new management practices
<p>3.4 Do you have MSDS (Material Safety Data Sheets) on file in the event of an emergency?</p>	<p><i>Evidence for verification assessment</i></p> <ul style="list-style-type: none">• View MSDS records are relevant and up-to-date
<p>3.5 If vessels require antifouling paints, is painting carried out according to best practice?</p>	<p><i>Required evidence</i></p> <ul style="list-style-type: none">• Provide SOP and register/records of antifoulant practice, or SOP is antifouling is not required. <p><i>Evidence for verification assessment</i></p> <ul style="list-style-type: none">• Confirm storage and manifest during site visit and interview staff to confirm control and management of biofouling• Confirm contracted services are approved for handling antifoulant <p><i>Global best practice</i></p> <ul style="list-style-type: none">• Chemical manifest / Biofouling Management Plan

3.6 Are farms (and/or vessels undertaking work on your farms) compliant in terms of hazardous substance storage, handling, and disposal?

Required evidence

- Provide Maritime Transport Operator Plan (MOTP) and certificate.
- Provide any hazard registers, hazardous substance SOPs, or related plans and policies.

Evidence for verification assessment

- Confirm MOTP on site
- Interview staff to confirm awareness, and observe appropriate storage
- Assess whether substance management meets Worksafe standards

Global best practice

- Materials Storage Handling and Waste Disposal plan

3.7 Are you certified to an appropriate level under any Maritime New Zealand safety management system e.g. MOSS? (not applicable for land-based farms/hatcheries)

Required evidence

- Provide Maritime Operator Safety System (MOSS) Certificate

Evidence for verification assessment

- Confirm certificate on site

3.8 Upload any additional certificates, training registers, SOPs, plans, or policies relating to pollutants and hazardous substance management here

Hydrology

3.9 Do you follow best practices to maintain water flow through your farm(s)?

Required evidence

- Documentation of best practices being followed. A Hydrology assessment – EIA may have been undertaken prior to farm establishment

Evidence for verification assessment

- Discuss water flow practices and effectiveness

Global best practice

- Hydrology Assessment or EIA

3.10 **Water Quality Research** - Please outline any new ideas for research or innovation relating to this water quality section that you have to share such as initiatives to reduce pollution in the aquatic environment

4 WASTE

Waste Audit

4.1 Do you record the amount of waste (in tonnes and/or m³) taken to landfill annually?

Required evidence

- Inventory recording waste to landfill

Evidence for verification assessment

- Confirm waste record keeping

Global best practice

- Waste collection template.
 - Evidence of downward trend or stable
-

4.2 Do you have a plan detailing appropriate storage and disposal of organic (e.g. shell used in vineyards, biofouling) and non-organic (e.g. ropes, lashings and floats) waste brought to shore?

Required evidence

- Provide Materials storage and handling plan, and or waste disposal SOP and staff training records

Evidence for verification assessment

- Confirm plan and interview staff to confirm training records and awareness

Global best practice

- Materials Storage Handling and Waste Disposal plan
 - MfE Solid Waste Analysis Protocol
-

4.3 Upload any additional plans, SOPs or company policies on waste management here

Recycling & Reduction

4.4 Do you have a Recycling and Reduction Plan?

Required evidence

- Provide Recycling and reduction Plan if you have one

Evidence for verification assessment

- Discuss policy during site visit and evidence of success

Global best practice

- Familiar with SBC Zero Waste Guide
-

4.5 Do you record the amount of recyclable plastic material e.g. floats / ropes?

Required evidence

- Provide SOP / records of recyclable materials

Evidence for verification assessment

- Confirm SOP, records and forms used for recording recyclable materials, and maintenance records

Global best practice

- Marine Operations Waste Management Plan
-

4.6 Have you made any swaps or movements toward plastic free alternative methods or materials in any area of your business? e.g. ropes, cutlery, lunch room supplies, lunch bags for staff, aprons, etc.

Farming Debris

- 4.7 Have staff been trained in best practice measures to eliminate farm debris? (e.g. lost lashing, floats, boat rubbish, etc)

Required evidence

- Provide SOP and Staff training records

Evidence for verification assessment

- View SOP that discuss farm debris and preventative measures, and interview staff to confirm training and awareness

Global best practice

- Marine Operations Waste Management Plan / Lashing strength testing documentation from supplier
-

- 4.8 Is there a local industry environmental programme available for your company to participate in?

If yes, please describe the programme and provide confirmation / certificate

Required evidence

- Provide records of participation

Evidence for verification assessment

- Confirm participation, discuss programmes and outcomes
-

- 4.9 Upload SOP's and environmental programme certificate(s) here

- 4.10 How many (formal or informal) environmental clean-up events have you participated in?

Evidence for verification assessment

- Discuss events during site visit
-

Do you keep a record of the volume and type of debris collected?

Required evidence

- Provide records of clean-up events
-

- 4.11 **Waste Research** - Please outline any new ideas for research or innovation relating to this waste section that you have to share such as initiatives to reduce/reuse/recycle waste including plastics and work with the community on marine debris issues.
-

5 RESOURCES

Farm Structures

- 5.1 Do you keep records of your maintenance and inspection activities?

Required evidence

- Provide SOP, farm maintenance records and inspection checklists

Evidence for verification assessment

- Confirm SOP are relevant to maintenance and inspection records.
- Interview staff to confirm training and awareness

Global best practice

- Engineers report upon establishment of farm
-

5.2 Upload your SOP, training records and an example of your farm maintenance and inspection records here

5.3 Do you have a contingency and/or response plan in the event of damage to, or loss of, your farm structures?

Required evidence

- Provide Infrastructure Contingency Plan

Evidence for verification assessment

- Interview staff to confirm training and awareness and confirm Contingency Plan

Global best practice

- Post storm checklist
-

Energy

5.4 Do you record the amount of fuel used across your farming operation annually?

Evidence for verification assessment

- Discuss records during site visit

Global best practice

- Scope 1 and 2 GHG report.
 - Advanced would be an LCA (which includes Scope 3 indirect emissions)
-

5.5 Do your work planning processes take into account energy efficiency?

Required evidence

- Provide company energy efficiency strategy

Evidence for verification assessment

- Confirm energy efficiency strategy and its effectiveness

Global best practice

- Life cycle assessment or Waste Reduction Action Plan
-

5.6 Upload any additional records of fuel used or energy efficiency initiatives here

5.7 **Resources Research** - Please outline any new ideas for research or innovation relating to this resources section that you have to share such as initiatives to maintain structures or reduce energy and optimise feed use.

6 FOOD SAFETY AND ANIMAL HEALTH

Food Safety

6.1 Do you (or your contracted harvester) have a Food Safety Plan or SOP for harvested product?

Required evidence

- Provide SOP, Harvest Food Safety Plan including Hygiene Policy

Evidence for verification assessment

- Confirm SOP and or Food Safety Plan for harvested products
-

<p>6.2 Have all harvesting and farming staff received training in food safety and harvesting requirements for Bivalve Molluscan Shellfish (BMS)?</p>	<p><i>Evidence for verification assessment</i></p> <ul style="list-style-type: none"> • Confirm training records and interview staff to confirm training and awareness <p><i>Global best practice</i></p> <ul style="list-style-type: none"> • Part 11 Harvesting BMS and Part 17 Health of Personnel BMSRCS on site. • Quality Management Plan
<p>6.3 Are you (or your contracted harvester) a current member/operator of a delivery centre programme operating under the Bivalve Molluscan Shellfish Regulated Control Scheme (BMS-RCS)?</p>	<p><i>Required evidence</i></p> <ul style="list-style-type: none"> • Provide BMSRCS Certificate / registration <p><i>Evidence for verification assessment</i></p> <ul style="list-style-type: none"> • Confirm certificate on site <p><i>Global best practice</i></p> <ul style="list-style-type: none"> • Shellfish Sanitation Programme Risk Management Plans
<p>6.4 Have all reporting and record keeping requirements been met for the BMS-RCS?</p>	<p><i>Required evidence</i></p> <ul style="list-style-type: none"> • Provide Shellfish QA Program records and reports <p><i>Evidence for verification assessment</i></p> <ul style="list-style-type: none"> • Confirm reporting and record keeping meets QA program
<p><i>Upload additional evidence of BMS-RCS reporting and record keeping here</i></p>	<p><i>Evidence for verification assessment</i></p> <ul style="list-style-type: none"> • Confirm records during VA

Traceability

<p>6.5 Are you able to trace harvested product back to individual farms in the event there is an issue?</p>	<p><i>Evidence for verification assessment</i></p> <ul style="list-style-type: none"> • Conduct traceback exercise during VA
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Animal Health & Welfare

<p>6.6 Are best practice management procedures for harvest followed as per the A+ Sustainable Management Framework (SMF) operations procedures?</p>	<p><i>Required evidence</i></p> <ul style="list-style-type: none"> • Provide SOPs to confirm compliance with SMF <p><i>Evidence for verification assessment</i></p> <ul style="list-style-type: none"> • Observe harvest to confirm SOP's comply with and harvest practices and SMF requirements
<p>6.7 Have all farm staff received training in shellfish behaviour, best husbandry guidelines and protocols contributing to shellfish health & welfare?</p>	<p><i>Required evidence</i></p> <ul style="list-style-type: none"> • Provide evidence of training records and SOP <p><i>Evidence for verification assessment</i></p> <ul style="list-style-type: none"> • Confirm animal husbandry SOP and interview staff to confirm training and awareness <p><i>Global best practice</i></p> <ul style="list-style-type: none"> • Shellfish Welfare Plan
<p>6.8 Do you have records of shellfish health, including disease, injury and mortality?</p>	<p><i>Evidence for verification assessment</i></p> <ul style="list-style-type: none"> • Confirm record keeping of shellfish health parameters and monitoring

- 6.9 **Food Safety & Animal Health Research -**
Please outline any new ideas for research or innovation relating to this food safety & animal health section that you have to share such as initiatives to enhance fish quality or traceability.
-

7 IWI PARTICIPATION

- 7.1 Is your farm owned or part-owned by Iwi interests?
-

- 7.2 In this period, have you proactively engaged/collaborated with your local Iwi?

Evidence for verification assessment

- Discuss during VA to confirm

Global best practice

- Communications Plan
-

Please outline any positive outcomes or new ideas for Iwi / industry engagement or collaboration you have to share.

Evidence for verification assessment

- Confirm Iwi rohe, engagement and initiatives
-

8 COMMUNITY

- 8.1 Do you have a record any complaints you receive and / or have a community complaints register?

Required evidence

- Register would include complaints on navigation, visual, noise, odour and debris, etc
 - Register should include detail on how each complaint was addressed
-

- 8.2 Please list the number of complaints you have received relating to navigation, visual issues, noise, odour, farm debris / waste, or other. If you have provided a complaints register simply write "register"
-

Navigation

- 8.3 Do you have inspection records for navigation aids as per your resource consent requirements?

Evidence for verification assessment

- Check Marine Farm Lighting Plan is approved as per resource consent and confirm inspection records meet requirements

Global best practice

- Maritime New Zealand Aids to Navigation Guidelines awareness
-

- 8.4 How many navigational incidents are you aware of relating to your farms?

Evidence for verification assessment

- View navigational incidents log, and discuss preventative measures are effective
-

Please describe the incident(s) and any mitigation initiatives you undertook as a result

Global best practice

- Communications Plan
-

Communication

8.5	How many meetings/engagement initiatives have you attended on relevant community issues?	<i>Evidence for verification assessment</i> <ul style="list-style-type: none">• Confirm community engagement records, outcomes and effective consultation
	<i>Please describe examples of your community engagement e.g. local meetings, local festivals, and regional plan submissions.</i>	<i>Evidence for verification assessment</i> <ul style="list-style-type: none">• Discuss community engagement initiatives <i>Global best practice</i> <ul style="list-style-type: none">• Communications Plan / Community consultation forums
8.6	How many staff do you employ across all farming operations?	<i>Evidence for verification assessment</i> <ul style="list-style-type: none">• Confirm employee records
8.7	Do you actively seek to procure services in your local regions wherever possible? E.g. hiring local contractors, buying supplies from local suppliers as opposed to shipping from overseas, etc	<i>Required evidence</i> <ul style="list-style-type: none">• Contractor contacts list / register <i>Evidence for verification assessment</i> <ul style="list-style-type: none">• Confirm evidence of local procurement of goods and services
8.8	Please give examples of any community events or organisations you support financially or with in-kind support	<i>Evidence for verification assessment</i> <ul style="list-style-type: none">• Discuss community engagement with regard to sponsorship, donations or in-kind support
8.9	Please describe how you communicate to the community (e.g. notices in the paper, social media, emails, website, etc)	<i>Evidence for verification assessment</i> <ul style="list-style-type: none">• Discuss communication formats during VA

Visual Effects

8.10	Does your maintenance programme, or those of your contractors, seek to ensure that farms are kept as tidy and well maintained as possible?	<i>Required evidence</i> <ul style="list-style-type: none">• Provide maintenance programme for farm / vessels / barges <i>Evidence for verification assessment</i> <ul style="list-style-type: none">• Confirm maintenance programmes comply with resource consent. Interview staff to confirm training and awareness <i>Global best practice</i> <ul style="list-style-type: none">• Preventative maintenance programme
8.11	Does your maintenance programme, or those of your contractors, seek to ensure that vessels and barges are kept as tidy and well maintained as possible?	<i>Evidence for verification assessment</i> <ul style="list-style-type: none">• Confirm with visual inspection during assessment

Noise and Odour

8.12	Do you have practices and training in place to manage odour?	<i>Evidence for verification assessment</i> <ul style="list-style-type: none">• Confirm SOP complies with resource consent.• Interview staff to confirm training and awareness
8.13	Do you have practices and training in place to manage noise?	<i>Evidence for verification assessment</i> <ul style="list-style-type: none">• Confirm SOP complies with resource consent.• Interview staff to confirm training and awareness

Employee Welfare

<p>8.14 Is your operation compliant with New Zealand Health and Safety at Work legislation?</p>	<p><i>Required evidence</i></p> <ul style="list-style-type: none"> • Provide Worksafe H&S (WHS) Management Plan, Incident procedure and hazard analysis report <p><i>Evidence for verification assessment</i></p> <ul style="list-style-type: none"> • Confirm WHS procedures and interview staff to confirm training and awareness. • Confirm incident investigation procedure and reporting process including H&S representative <p><i>Global best practice</i></p> <ul style="list-style-type: none"> • Dive Management Plan if applicable
<p>8.15 How many notifiable events have been recorded across your operation?</p>	<p><i>Evidence for verification assessment</i></p> <ul style="list-style-type: none"> • Confirm and discuss most recent Lost Time Injury? or WHS incident <p><i>Global best practice</i></p> <ul style="list-style-type: none"> • HR3 or similar software
<p>8.16 What was your LTIFR (Lost Time Injury Frequency Rate)?</p>	<p><i>Evidence for verification assessment</i></p> <ul style="list-style-type: none"> • Confirm calculation of LTIFR and discuss initiatives to reduce incidents
<p>8.17 Do you, or your contract divers, have current records of diving qualifications and dive logs?</p>	
<p>8.18 Is your operation compliant with New Zealand employment law including hours of work & minimum wage?</p>	<p><i>Evidence for verification assessment</i></p> <ul style="list-style-type: none"> • Confirm wages/salary meets minimal wage requirements, and view employee employment contract
<p>8.19 Please describe any initiatives you have in place to improve employee welfare</p>	
<p>8.20 Community Research - Please outline any new ideas for research or innovation relating to this community section that you have to share such as initiatives to improve navigational safety, community support programmes, improvement of amenity values or employee support programmes.</p>	<p><i>Evidence for verification assessment</i></p> <ul style="list-style-type: none"> • Discuss during site assessment

Scorecard



Total

10.2 Appendix 2. Legislation

This appendix contains a comprehensive summary of legislation that may influence the environmental performance of Greenshell mussel participants. This register was completed in 2014. Operators should ensure that they remain aware of any changes to existing legislation/regulation or new requirements.

Animal Products Act 1999

The Animal Products Act 1999 is New Zealand's legal framework for processing animal material into food.

It establishes a risk management system that requires all animal products traded and used to be 'fit for intended purpose' through meeting New Zealand animal product standards.

Section 2 of the Animal Products Act sets out its objectives to —

- a. Minimise and manage risks to human or animal health arising from the production and processing of animal material and products by instituting measures that ensure so far as is practicable that all traded animal products are fit for their intended purpose; and
- b. Facilitate the entry of animal material and products into overseas markets by providing the controls and mechanisms needed to give and to safeguard official assurances for entry into those markets.

The Animal Products Act is about the effective and efficient management of known physical, biological and chemical hazards that might present a risk, irrespective of where in the production/processing chain they occur. It also intends to ensure that products produced under the Act are wholesome and true to label.

The risk management system potentially covers operations from production and harvesting through processing, transportation, storage, to the domestic market or export for all animal materials and products. For exports it also enables the notifying of export requirements and the issuing of official assurances.

Part 4 of the Act provides for the establishment of New Zealand animal product standards that set criteria to be met so that particular animal products can be treated as fit for their intended purpose.

Animal Products (Regulated Control Scheme: Bivalve Molluscan Shellfish) Regulations 2006

The New Zealand Shellfish Regulated Control Scheme came into force on 1 June 2006 and is effectively an update of the previous Industry Agreed Implementation Standard IAIS005.1.

The Regulation sets out standards, obligations and requirements in relation to growing, harvesting, sorting and transporting Bivalve Molluscan Shellfish (BMS) intended for human consumption. Standards, obligations and requirements aim to identify, monitor, evaluate and manage the risks associated with the commercial growing, harvesting, sorting and transporting of BMS.

The scheme applies to all activities involved in growing, harvesting, sorting and transporting BMS for commercial purposes up until the time when BMS are received by a wholesaler or retailer or sold direct to the consumer.

Aquaculture Law Reform Legislation of 2011

Until 1 January 2005, aquaculture was governed by a combination of the Resource Management Act 1991 and the Fisheries Act 1983. Marine farming applicants were required to obtain resource consent from the relevant council before getting a marine farming permit from the Ministry of Fisheries.

This double permitting system was time consuming and ineffective in managing the rapidly growing aquaculture industry.

As a result, Aquaculture Law Reform Legislation came into effect on the 1st of October 2011.

The reform legislation, which included several Acts, amended the earlier Aquaculture Reform (Repeals and Transitional Provisions) Act 2004, the Fisheries Act 1996, the Maori Commercial Aquaculture Claims Settlement Act 2004, and the Resource Management Act 1991.

The main features of the new regime are that:

- There is now a single process for aquaculture planning and consents through the Resource Management Act 1991 (RMA).
- Regional and unitary councils have clearer roles and responsibilities for managing all the environmental effects of marine farming, including any effects on fisheries and other marine resources.
- Aquaculture management areas are no longer required. New applications can be made subject to the provisions of the relevant coastal plan.
- The undue adverse effects on fishing test under the Fisheries Act 1996 has been streamlined to better integrate with consent processes and balance commercial interests of commercial quota holders and aquaculture.
- Existing marine farm leases and licences are deemed to be coastal permits by the transitional provisions.
- The reform has also provided for the full and final settlement to Maori for commercial aquaculture.

Biosecurity Act 1993

The Biosecurity Act (1993) integrates a number of requirements from previous acts which covered pest control in New Zealand. The BSA (1993) enables Pest Management Strategies (PMSs) to be developed for each of the important pests. These PMSs are to be developed at the regional level (RPMs) or at the national level (NPMs), and define the role and responsibilities of pest management agencies in the control of pests, the procedures to be followed, and how pest management is to be funded.

The Ministry for Primary Industries (MPI) has the lead role in biosecurity, including preventing unwanted pests and diseases being imported, and controlling, managing or eradicating them should they arrive. MPI is tasked with a 'whole of system' leadership role, encompassing economic, environmental, social and cultural outcomes. It also has international trade and animal welfare responsibilities.

Fisheries Act 1996

The purpose of the Fisheries Act 1996 is to provide for utilisation of fisheries resources while ensuring sustainability. Ensuring sustainability includes avoiding, remedying or mitigating any adverse effects of fishing on the aquatic environment. Utilisation is defined as conserving, using, enhancing and developing fisheries resources to enable people to provide for their social, economic, and cultural well being.

In addition, the Act's environmental principles provide that:

- associated or dependent species should be maintained above a level that ensures their long term viability;
- biodiversity of the aquatic environment should be maintained; and
- habitats of particular significance for fisheries management should be protected.

Food Act 1981

In New Zealand, food is regulated under the Food Act 1981 and delegated legislation under that Act. The Food Act 1981:

- Outlines prohibitions on sale (including unfit food)
- Prohibits misleading labelling and advertising
- Contains provisions to make regulations and food standards.

Hazardous Substances and New Organisms Act 1996

The Hazardous Substances and New Organisms (HSNO) Act was brought in to protect the environment, people and communities from the adverse effects of hazardous substances and new organisms. The

Authority of ERMA New Zealand is governed by this Act.

The HSNO Act is all-embracing. It covers all new organisms and hazardous substances.

A new organism could be a plant, animal or micro-organism coming into New Zealand for the first time or a new species developed through genetic modification.

Hazardous substances could be explosive, flammable, corrosive, toxic or eco-toxic. For hazardous substances, the Act takes a 'cradle to grave' approach and allows the Authority to set controls on how substances are contained, labelled, stored, used, transported or disposed of. Substances may be reassessed if new information warrants it.

Other laws continue to apply alongside HSNO and in some situations additional approvals may be required. These other Acts include the Agricultural Chemicals and Veterinary Medicines Act, the Biosecurity Act, the Medicines Act, the Food Act and the Resource Management Act.

Some pieces of legislation will be replaced when substances have been transferred to HSNO. These include:

- Explosives Act 1957
- Dangerous Goods Act 1974
- Toxic Substances Act 1979
- Pesticides Act 1979
- Gas Act 1992

Under the HSNO Act, a hazardous substance is any substance that exceeds the level defined in regulations of any of the following properties:

- an explosive nature (including substances, articles and pyrotechnics such as fireworks)
- flammability
- ability to oxidise (that is, to accelerate a fire)
- corrosiveness
- acute or chronic toxicity
- ecotoxicity, with or without bioaccumulation (that is, it can kill living things either directly or by building up in the environment)
- can generate a hazardous substance on contact with air or water.

The HSNO Act also controls compressed gas containers, whether or not the gas itself is hazardous. In reality, most hazardous substances have more than one hazardous property, that is, they are hazardous in a number of ways. For example, methylated spirits and petrol are not only flammable but also toxic.

Anyone who uses or is involved with hazardous substances needs good information on their potential risks and how to use them safely. The Hazardous Substances and New Organisms (HSNO) Act provides a platform for completely assessing a hazardous substance so that it can be managed appropriately.

Health and Safety in Employment Act 1992

The objective of the Health and Safety in Employment Act 1992 is to promote the prevention of harm to all people at work, and others in, or in the vicinity of, places of work.

The Act applies to all New Zealand workplaces and places duties on employers, the self-employed, employees, principals and others who are in a position to manage or control hazards.

The emphasis of the law is on the systematic management of health and safety at work. It requires employers and others to maintain safe working environments, and implement sound practice. It recognises that successful health and safety management is best achieved through good faith cooperation

in the place of work and, in particular, through the input of those doing the work.

The Ministry for Business, Innovation and Employment (MBIE) administers and enforces the Act in most workplaces. Maritime New Zealand administers and enforces the Act in the maritime sector.

There are a number of Occupational Health and Safety (OSH) Regulations and “Approved Codes of Practice’ developed under the Health and Safety Employment Act that detail measures to manage hazards in the workplace, for example, in relation to the storage and use of chemicals or fuels, staff training and emergency planning.

Local Government Act 1974 and 2002

The Local Government Act 2002 is the foundation legislation for the local government sector and is the power and responsibility of local authorities providing the general framework and powers under which New Zealand's 86 democratically elected and accountable local authorities operate.

Under part 8 of the Act territorial authorities are able to make bylaws to protect the public from nuisance, to protect, promote and maintain public health and safety, and to minimise the potential for offensive behaviour in public places.

Regional councils are able to make bylaws in respect of regulating their forestry operations, parks and reserves, flood protection and control works, water supply works. Pursuant to Schedule 18 of the Local

Government Act 2002, Part 39A (Navigation) of the Local Government Act 1974 has not been repealed.

Navigation bylaws are made under Part 43 section 684B of the Local Government Act 1974 and are read in conjunction with the Maritime Rules and Regulations of New Zealand.

Marine Mammals Protection Act 1978

The Marine Mammals Protection Act 1978 makes provision for the protection, conservation and management of marine mammals within New Zealand and within New Zealand fisheries waters and is administered by the Department of Conservation.

A permit is required under the Act for anyone to ‘take’ a marine mammal. The definition of ‘take’ includes actions that harm, harass, injure and attract. While the Act is effective in dealing with directed takes, it does not prevent the accidental (or incidental) take of marine mammals in fishing operations (by-catch).

The Act provides an obligation of reporting in the event of any accidental or incidental mortality or injury of any marine mammal including the location of the area, the species or general description of the mammal, and a description of the conditions and circumstances of the event. It is an offence to fail to report such an incident with a penalty of up to \$10,000.

The Act provides for the establishment of marine mammal sanctuaries, within which fishing activities can be strictly controlled by the Minister of Conservation. There are six marine mammal sanctuaries in New

Zealand - around Banks Peninsula, the Catlins Coast, Te Waewae Bay, Clifford and Cloudy Bay, the West Coast of the North Island (to protect Hector's dolphin), and the Auckland Islands (to protect the main breeding areas of the New Zealand sea lion and the southern right whale).

Marine Reserves Act 1971

The Marine Reserves Act 1971 is the current legislation used to establish and manage marine reserves administered by the Department of Conservation. The purpose of the 1971 Marine Reserve Act is 'to preserve as marine reserves for the scientific study of marine life, areas of New Zealand that contain underwater scenery, natural features or marine life of such distinctive quality or are so typical or beautiful or unique that their continued preservation is in the national interest'.

In the 1971 Act the boundaries of a marine reserve do not extend inland beyond the foreshore, or beyond the 12 mile territorial limit. The reserves are protected from human impacts such as fishing and it is an offence to disturb marine life or pollute the water.

As the current law is over 30 years old it is now not considered to be able to meet today's marine protection needs, in particular to provide for the protection of marine biodiversity.

A draft new Marine Reserves Bill was introduced to Parliament on the 7th June 2002, which has since been withdrawn for redrafting in line with the Marine and Coastal Area (Takutai Moana) Act 2011, and the Exclusive Economic Zone and Continental Shelf (Environmental Effects) Act 2012.

Maritime Transport Act 1994

Under the Maritime Transport Act 1994 Maritime New Zealand's principle objectives are to promote a safe maritime environment and provide effective marine pollution prevention and an effective marine oil pollution response system.

The Maritime Transport Act 1994 sets out the broad principles of maritime law, and also sets out the environmental controls inside the 12 nautical mile limit that are to be managed under the Resource Management Act 1991. Thus, in the Coastal Marine Area, the Maritime Transport Act has a management component which overlaps with the RMA.

Maritime rules relate to the safety and security of ships and people. The rules prescribe requirements for ship design, construction, equipment, crewing, operation and tonnage measurement, and for the carriage of passengers and cargoes. Many of the standards are based on international ship safety conventions.

Marine protection rules are aimed at preventing pollution of the sea from ships and the disposal of waste.

Maritime Rules Part 40C Design, Construction & Equipment - Non-SOLAS (Safety of Life at Sea) Non-Passenger Ships

Part 40C applies to non-passenger motor ships which do not proceed beyond restricted limits, non-passenger motor ships which are less than 45 metres in length proceeding beyond restricted limits, non-passenger motor ships of less than 500 tonnes gross tonnage which undertake an international voyage, barges that carry any persons and barges of 24 metres in length or more which do not carry persons.

The Part is divided into 4 sections. Section 3 of part 40C deals with marine farming vessels and contains special provisions for marine farming vessels relating to design and construction, bulwarks and guardrail and safety equipment.

Maritime Rules Part 91 Navigation Safety Rules

A key object of Part 91 is to set basic national navigation standards. These in turn can be enforced locally by regional councils through consistent navigation safety bylaws made under the Local Government Act 1974. Regional variation is permitted in the navigation safety bylaws through mechanisms prescribed in Part 91.

Regional councils can address local navigation safety issues through mechanisms such as temporary and permanent reserved areas, access lanes and speed upliftings.

Maritime Rules Part 21 Safe Ship Management (SSM)

Ship safety management has been introduced in New Zealand, in line with a global move towards a culture of putting ongoing safety measures in place to prevent maritime accidents.

The Safe Ship Management (SSM) System administered by Maritime New Zealand now makes ship owners and operators responsible for the daily safe operation of their vessels. This ensures that the safety of a vessel and its crew is maintained throughout the year instead of just on the annual 'survey day'.

The monitoring of this system is done by inspections and audits which are carried out from time to time by approved SSM companies, replacing the previous system of an annual survey. After each inspection, each vessel's safety profile is assessed. Higher risk vessels are inspected more often.

The system covers construction, stability, equipment, operating limits, operating parameters, the qualifications of its crew, training of crew, vessel maintenance and emergency procedures. An SSM Certificate is a vessel's maritime document. It replaces the Survey Certificate. Every commercial vessel must display a valid SSM Certificate and operate in accordance with its Safety Management Manual.

Section 2 of part 21 applies to New Zealand ships which do not proceed beyond restricted limits, fishing ships, and ships of less than 45 metres in length which go beyond restricted limits but are not required to comply with section 1. These ships are required to operate in an approved safe ship management system managed by an organisation which has been approved by the Director for that purpose.

Section 2 prescribes the requirements that an organisation must comply with for approval by the Director and the conditions for a ship to enter an organisation's approved safe ship management system. Once in the system the owner must maintain and operate the ship in compliance with the requirements of the New Zealand Safe Ship Management Code. The New Zealand Safe Ship Management Code provides a standard for the safe management and operation of ships and for pollution prevention, which is tailored to smaller ships. Compliance with the Code is verified by the organisation managing the approved safe ship management system. Section 2 does not cover those ships for which maritime rules require the owner to establish a safe operational plan.

The system covers every single aspect of a vessel and its operations. This includes construction, stability, equipment, operating limits, operating parameters, crew qualifications, training of crew, vessel maintenance and emergency procedures.

Maritime New Zealand Guidelines for Aquaculture Management Areas and Marine Farms, December 2005

This document sets out the guidelines of Maritime New Zealand in relation to marine farms. The guideline is intended to support the appropriate authorities and give guidance to marine-farm applicants on areas of concern for Maritime New Zealand with respect to navigational safety. The guidelines identify relevant navigational issues and describe the criteria that regional councils and marine farm applicants should be aware of during the process of the establishment and management of marine farms.

National Environmental Standards for Marine Aquaculture

These regulations, which come into force on 1 December 2020, are made under the Resource Management Act 1991 and prescribe standards and other requirements for existing marine farms.

These regulations provide for replacement coastal permits for existing marine farms, including in some situations, the ability for an existing marine farm to realign or make changes to consented species. The

regulations prescribe specific requirements for seeking the views of tangata whenua on draft coastal permit applications. Where that does not occur, councils can impose more stringent notification requirements and have the ability to more broadly assess the effects of an application on tangata whenua values.

The NES-MA were established to:

- increase regulatory consistency and certainty
- ensure environmental effects are appropriately managed
- increase industry confidence to promote investment.

Development of the NES-MA was an important action of the Government's Aquaculture Strategy.

Resource Management (Marine Pollution) Regulations 1998 Pursuant to the Resource Management Act 1991 the Resource Management (Marine Pollution)

Regulations cover dumping, incineration, and discharges in the coastal marine area. These regulations work in conjunction with Regional Coastal Plans to control dumping and discharge of sewage, oil litter and ballast water from mussel industry and other vessels.

The Building Act 2004

The Building Act 2004 aims to improve control of, and encourage better practices in, building design and construction. This means:

- more clarity on the standards we expect buildings to meet,
- more guidance on how those standards can be met,
- more certainty that capable people are undertaking building design, construction and inspection,
- more scrutiny in the building consent and inspection process,
- better protection for homeowners through the introduction of mandatory warranties.

Part 2 of the Act deals with matters relating to the building code. The Building Code articulates New Zealanders' expectations about the quality of buildings. All building plans must be assessed by building officials to ensure they comply with the Building Code before a building consent is issued. The New

Zealand Building Code is performance based. That means it specifies the level of performance for building work, not how the work should be done.

Waste Minimisation Act 2008

The Waste Minimisation Act 2008 encourages the reduction of waste generated and disposed of and aims to reduce the harmful effects of waste on the environment. It provides roles and responsibilities to local authorities to manage and minimise waste. The WMA 2008 introduced a levy on waste to landfill and a Fund for projects which improve waste management and minimisation. It provides roles and responsibilities to territorial authorities to promote effective and efficient waste management & minimisation in their area. This includes business resource efficiency programmes.

Wildlife Act 1953

All wildlife unless specified under Schedules 1-5 of the Act are absolutely protected throughout New Zealand and New Zealand fisheries waters. This includes many seabirds (excluding Black, Little, and Pied Shag's and the Sooty shearwater) which may be encountered during operations. It is an offence to kill any absolutely protected species or to rob, disturb, or destroy nests. Reference should be made to any relevant population management plans and maximum allowable level of fishing related mortality.

Any person who accidentally or incidentally kills or injures any marine wildlife (declared to be wildlife under Schedule 7) must report the event to a ranger or fisheries officer under risk of penalty. Marine wildlife declared to be animals under this Act are mostly deep sea or open ocean species unlikely to be encountered in coastal aquaculture facilities.

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